THE JOURNAL

of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 147, NO. 18 — CHICAGO, ILLINOIS — DECEMBER 29, 1951

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COMPLETE FUNCTIONAL RECOVERY AFTER CORONARY OCCLUSION AND INSUFFICIENCY

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Three decades have elapsed since coronary occlusion became widely recognized as a clinical entity. It is now possible, therefore, to have a comprehensive view of the acute attack and to study its subsequent course among the many patients who have survived. At first, only the severe attacks were recognized as occlusions and their mortality rate was high. The prognosis for all patients with coronary occlusion, therefore, was considered to be poor. Later, the introduction of early and complete bed rest, a low-calorie diet, and the discreet use of drugs saved many lives.[1] It is now relatively simple to recognize mild and atypical acute coronary episodes, from which the patient usually recovers. The mortality rate in first attacks of the disease is, at present, only 10% or less. As a result, the early pessimism concerning an acute coronary occlusion has gradually diminished.

The progress of patients who have survived an occlusion has, hitherto, received only sporadic study.[2] A number of years ago White and Bland [2a, e] and the present authors, with Dack,[2d, f] pointed out that one-third of the patients who sustained an occlusion had no symptoms afterward and did not have to restrict their activities. One-half of them resumed gainful employment. In a recent series of 84 patients, 43% were working one year after the attack.[2g] Occasionally, patients have lived for 20, and even 40 years, after an occlusion.[3]

Despite these findings, many physicians and laymen still believe that a coronary occlusion necessarily causes a marked reduction in the patient's activities and a marked decrease in his life expectancy. It has even been stated that the average duration of life, after an acute occlusion, is 4.2 years.[2b]

Our previous follow-up studies and our more recent experience have increased our optimism concerning coronary occlusion. We have been more and more impressed by the large number of patients who have made a complete functional recovery and who have led active lives for many years. In the present report we shall discuss this latter group of cases; later we shall consider those patients who continued to have symptoms after the attack.

In addition to the cases of acute coronary occlusion, we have reviewed those with acute coronary insufficiency.[4] The latter results from a sudden disproportion between the coronary flow and the needs of the myocardium, without any fresh occlusion. In some cases the coronary arteries are not severely narrowed. Coronary occlusion almost invariably occurs spontaneously, whereas coronary insufficiency may take place either spontaneously or as a result of conditions which suddenly increase the work of the heart, diminish coronary flow, or reduce the oxygen-carrying capacity of the

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2. (*a*) White, P. D.: A New Record in Longevity After Coronary Thrombosis, J. A. M. A. **108**: 1796 (May 22) 1937. (*b*) Palmer, J. H.: Prognosis Following Coronary Thrombosis with Special Reference to Influence of Hypertension and Cardiac Enlargement, Quart. J. Med. **6**: 49, 1937. (*c*) Drake, E. H.: Long Survival Following Coronary Thrombosis, Am. Heart J. **20**: 634, 1940. (*d*) Master, A. M., and Dack, S.: Rehabilitation Following Acute Coronary Artery Occlusion, J. A. M. A. **115**: 828 (Sept. 7) 1940. (*e*) Bland, E. F., and White, P. D.: Coronary Thrombosis (with Myocardial Infarction): 10 Years Later, ibid. **117**: 1171 (Oct. 4) 1941. (*f*) Master, A. M.; Dack, S., and Jaffe, H. L.: Follow-Up Studies in Coronary Artery Occlusion: Degree of Recovery, Symptoms, and Physical Signs, New York J. Med. **42**: 413, 1942. (*g*) Levine, E. B., and Phillips, E.: Coronary Occlusion in Industry: A Study of 84 Cases with Reference to Subsequent Employability, Am. Heart J. **29**: 588, 1945. (*h*) Penner, S. L., and Peters, M.: Longevity with Ventricular Aneurysms, New England J. Med. **234**: 523, 1946.

3. White,[2a] Palmer,[2c] Penner.[2h]

4. (*a*) Büchner, F.; Weber, A., and Haager, B.: Koronarinfarkt und Koronarinsuffizienz in vergleichender elektrokardiographischen und morphologischen Untersuchung, Leipzig, Georg Thieme, 1935. (*b*) Master, A. M., and Jaffe, H. L.: Coronary Insufficiency and Myocardial Necrosis Due to Acute Hemorrhage, J. Mt. Sinai Hosp. **7**: 26, 1940. (*c*) Master, A. M.; Jaffe, H. L.; Dack, S., and Grishman, A.: Coronary Occlusion, Coronary Insufficiency, and Angina Pectoris: A Clinical and Post-Mortem Study, Am. Heart J. **27**: 803, 1944. (*d*) Master, A. M.; Dack, S.; Grishman, A.; Field, L. E., and Horn, H.: Acute Coronary Insufficiency: An Entity; Shock, Hemorrhage Embolism as Factors in Its Production, J. Mt. Sinai Hosp. **14**: 8, 1947.

blood.[5] The commonest causes are effort, exertion, trauma, acute hemorrhage (particularly of the gastrointestinal tract), shock, operation, tachycardia, aortic stenosis, and excessive administration of insulin. Coronary insufficiency may cause only myocardial ischemia or, if it is severe enough, it produces focal necrosis of the subendocardial region, instead of the through-and-through infarction from endocardium to pericardium associated with coronary occlusion which completely obstructs the artery.

Attacks of coronary insufficiency are usually more severe than angina pectoris and milder than coronary occlusion. Coronary insufficiency can be differentiated from occlusion by means of the electrocardiogram in 95% of the cases. In coronary occlusion there are deep Q waves and RS-T elevation that is gradually replaced by persistent T wave inversion.[4c] In coronary insufficiency T wave changes and RS-T depression usually appear early and return to normal in several days or weeks. These electrocardiographic differences arise from the fact that in coronary insufficiency only the subendocardial region is usually involved. (Occasionally coronary occlusion produces the electrocardiographic pattern usually associated with coronary insufficiency. This holds particularly when the infarct involves the true posterior surface of the left ventricle; what is ordinarily termed "posterior" infarction is actually diaphragmatic.[5b])

Energetic and prompt treatment of the conditions precipitating acute coronary insufficiency usually overcomes the latter. Although death may occur suddenly as a result of the coronary insufficiency, the spontaneous attack usually subsides, since the myocardial necrosis is not extensive, and the patient recovers. However, some of these patients have severe coronary disease and continue to experience frequent anginal pain. In this report we shall consider in detail the group which has recovered completely.

Not infrequently a spontaneous episode of coronary insufficiency is the precursor of a coronary thrombosis which may develop in several days or weeks.[6] These cases have been included in the series of coronary occlusion.

MATERIAL

During the past 25 years we have personally observed 554 patients during or after an attack of coronary occlusion. Seventy-nine of the patients with coronary occlusion were seen only during the acute attack. (Thirty-five of these 79 patients died during the acute attack. Most of them were severely ill and were seen only once in consultation.) In 63, a satisfactory follow-up was not possible. Thus, in this study, the course following coronary occlusion was studied in 412 patients. In addition, 141 patients were investigated after acute coronary insufficiency. The average duration of the follow-up study was 6.5 years, the range being from 3 months, in a few cases, to 29 years, in one case. The average age of onset of the attack was 54 years. There were 345 men and 67 women, a ratio of 5 to 1. Eighty per cent of the 412 studied were seen in private practice; the remainder were ward patients.

PROCEDURE

Coronary Occlusion.—In determining the degree of functional recovery, the 412 patients were divided into four groups according to symptoms:

1. Those who did not experience anginal pain, dyspnea, or severe weakness. The majority of these patients felt very well, and resumed their previous occupations, or engaged in similar work. It was not necessary for their activity to be restricted; however, in some cases curtailment was imposed by the patient himself or on the advice of a physician merely because of the previous occurrence of coronary occlusion.

2. Those who experienced mild or infrequent anginal pain on exertion or emotion, but whose activities were only slightly restricted. Many of these patients were working, although a number complained of some weakness and of slight dyspnea on exertion.

3. Those who experienced severe or frequent angina, not only on exertion, but sometimes at rest. They were quite weak. Some complained of moderate dyspnea on exertion. Their activity was definitely restricted, although a few could perform light work.

4. Those who had definite symptoms of congestive failure, or an intractable anginal syndrome. Their activities were markedly or completely restricted, although two of this group worked as executives.

In addition to this primary classification on the basis of symptoms, the patients were further divided into four groups (A, B, C, D) according to the objective findings disclosed by physical examination, blood pressure reading, fluoroscopy, x-ray, and electrocardiogram. Six chest leads were taken in the majority of cases; in many the unipolar extremity leads were also recorded. A "two-step" exercise electrocardiogram and a ballistocardiogram were recorded in a small number of the patients, but the results of these two tests were not considered when the patients were secondarily placed into the following classifications:

A. Those in whom the physical examination of the heart, the blood pressure, fluoroscopy and x-ray, and the electrocardiogram were normal, or practically so. In some electrocardiograms, for example, there were small narrow Q waves, particularly in leads 2, 3, and V_F, somewhat low T waves in the standard leads, or small R waves in leads V_1, V_2 and V_3. On x-ray examination some of these patients showed fullness or rounding of the lower left border of the heart; this may have indicated minimal hypertrophy of the left ventricle.

B. Those in whom there were mild or moderate abnormalities in the electrocardiogram and/or in the size of the heart. In some cases the changes in the electrocardiogram were minimal; for example, a Q wave in A-V_F, or in one chest position. In four patients, the electrocardiogram was normal.

C. Those in whom there was a marked enlargement of the heart, usually with reversal of pulsation, and/or advanced changes in the electrocardiogram. In many of the patients in this group, a definite diagnosis of ventricular aneurysm could be made.

D. Those in whom there was definite evidence of congestive failure.

Since the patients were divided into four groups on the basis of both subjective and objective findings, they fall into 16 separate subgroups, ranging from 1A to 4D (Table 1). For example, Group 1A includes those who made a complete functional recovery, and who showed normal findings electrocardiographically and roentgeno-

5. Footnotes 4b, 4c, and 4d. (*a*) Master, A. M.; Dack, S., and Jaffe, H. L.: Activities Associated with the Onset of Acute Coronary Artery Occlusion, Am. Heart J. **18**: 434, 1939. (*b*) Master, A. M., and Jaffe, H. L.: Factors in Onset of Coronary Occlusion and Coronary Insufficiency: Effort, Occupation, Trauma, and Emotion, J. A. M. A., to be published.

6. Jaffe, H. L.: Electrocardiographic Changes of Coronary Insufficiency During the Formative Stage of Coronary Occlusion, with Note on Posterior Location of Anginal Pain, J. Mt. Sinai Hosp. **16**: 404, 1950.

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logically. Group 3C includes those who made a poor functional recovery, and who showed marked enlargement of the heart, probably paradoxical pulsation, and advanced electrocardiographic changes.

RESULTS

Findings in Coronary Occlusion.—Of the 412 patients, 297 are alive and 115 are dead; the mortality rate was 28% (Table 1). Four are known to have died of extracardiac causes. It will be seen (Tables 1 and 2) that 154 patients (37.5% of the 412 patients followed) have made a complete functional recovery (Groups 1A, 1B, 1C). Many of the patients who recovered completely were free of symptoms, except for a short period of anxiety and weakness, after the acute attack had subsided. Of the others who survived, 115 (28% of all the patients) made a satisfactory recovery but experienced occasional angina on effort (Group 2).

TABLE 1.—*Follow-Up in 412 Patients with Coronary Occlusion*

Group	Living	Dead
1A	26	3
1B	102	29
1C	26	4
	154	36
2A	9	0
2B	84	29
2C	21	25
2D	1	0
	115	54
3B	7	5
3C	9	12
3D	2	0
4B	1	3
4C	2	5
4D	7	10
	28	35
Total	297	115

Of the 154 who had made a complete functional recovery, 26 had hearts of normal size and normal electrocardiograms (Group 1A), 102 had some enlargement of the heart or an abnormal electrocardiogram (Group 1B), and 26 had marked enlargement of the heart or advanced changes in the electrocardiogram (Group 1C). Although the patients in this latter group were asymptomatic, 10 of the 26 presented definite evidence of ventricular aneurysm; i. e., a bulge in the ventricular shadow, and large Q waves and persistent RS-T elevation in the electrocardiograms. In two patients with a large heart, the electrocardiogram was interpreted as being within normal limits.

Thirty-eight (25%) of the 154 survivors, who made a complete functional recovery (Group 1—A, B, C), have lived more than 10 years since the attack, and 61 (40%) have lived more than 5 years (Table 2). The length of survival was slightly greater in Group 1A than in Groups 1B and 1C.

The average age of onset of the coronary occlusion in those who had made a complete functional recovery was 52 years; the youngest patient was 26, the oldest 77. Forty of the 154 patients were obese, and only three had diabetes. Following the occlusion, 19 had a systolic pressure of 170 or more, or a diastolic pressure of 100 or more. Seventy-five patients had an anterior infarction and 74 a posterior infarction. The heart was normal in size in 75% of the patients, and the electrocardiogram was normal in 20%. Reversal of pulsation occurred in 18%. The "two-step" exercise electrocardiogram was positive in 11 patients, and negative in 23. The ballistocardiogram was abnormal in 18 patients, normal in 6, and borderline in 1.

TABLE 2.—*Complete Recovery in Coronary Occlusion: Group 1 (A, B, C) Living and Dead (180 Cases or 44% of Total Series)*

Living	154
Dead	26
Mortality Rate	19%
Living	
After 10 yr	38 (25%)
After 5 yr	61 (40%)
Dead	
Lived over 10 yr	12 (46%)
Lived over 5 yr	18 (77%)
Lived under 5 yr	6 (23%)

It was possible to learn of the activities of 128 of the 154 patients who had made a complete functional recovery. Seventy-seven (60%) were working full-time, at their original job or professions (Table 3). (This was particularly true of physicians.) Thirty-one (23%) were doing moderate or part-time work, and 20 (17%) were not working. At least half of the latter group could have worked had it been necessary for them to do so. All the patients in Group 1A were working, and practically all were doing full-time work. It is notable that many of the patients in Group 1C were also working full-time, and only a small minority were not working at all. The list of occupations was very varied and included executives and business men, judges, lawyers, doctors, storekeepers, clerks, salesmen, plumbers, electricians, tailors, and waiters. Because the majority of the patients were seen in private practice, there were few laborers. One patient resumed his job as cable splicer in three months.

TABLE 3.—*Extent of Work Following Coronary Occlusion*

Group	Full Time	Part Time	No Work
1A	20	2	0
1B	49	19	16
1C	8	10	4
	77 (60%)	31 (23%)	20 (17%)
2A	3	1	4
2B	25	22	27
2C	1	7	6
	29 (30%)	30 (30%)	37 (40%)
3B	0	1	1
3C	0	3	4
3D	0	5	5
4B	0	0	1
4C	0	0	3
4D	0	2	3

In four patients who had made a complete functional recovery a second coronary occlusion developed after a number of years. Seven experienced episodes of acute coronary insufficiency. In each instance the patient again became free of symptoms after the acute attack had passed.

In addition to the 154 living patients who have made a complete functional recovery, 26 others had made a complete recovery but subsequently died of another occlusion or of acute coronary insufficiency (Table 1).

Thus, the mortality rate in Group 1 (A, B, C) was only 14.4%; it was 28% in all the cases followed, and 38.5% in Groups 2, 3, and 4 (Table 4). The mortality rate was almost as low in Group 1C (those with functional recovery, but with marked electrocardiographic changes and/or cardiac enlargement) as in Group 1A. It is important to note that, of the 26 patients who recovered completely (Group 1) and later died, 12 (46%) survived for more than 10 years, and 18 (77%) for more than five years. Only six patients (23%) in this group lived for less than five years after the attack (Table 2).

Since the prognosis following coronary occlusion is said to be better in young persons, we studied separately those patients whose attacks occurred before the age of 45. There were 48 such patients, including one 35-year-old woman, in whom there was no history of hypertension, diabetes, or gallbladder disease. The mortality rate among these younger patients was lower (23%), the incidence of complete functional recovery was higher (42%), and the period of survival was longer, than among the older age group, which consisted of 364 patients whose attacks occurred after age 45, in which the mortality rate was 28.5%, and the complete functional recovery was 37%. Twenty-three patients under 45 made a complete functional recovery, and three died.

TABLE 4.—*Mortality Following Coronary Occlusion*

	Patients		Mortality Rate
	Living	Dead	
Total	297	115	28.0%
Group 1	154	26	14.4%
Groups 2, 3, 4	143	89	38.5%

TABLE 5.—*Follow-Up in 141 Patients with Coronary Insufficiency*

Group	Living	Dead
1A	52	1
1B	21	2
2A	22	3
2B	26	5
2C	1	0
2D	2	0
3A	1	0
3C	1	0
4A	0	1
4C	1	0
4D	1	1
Total	128	13 (9%)

Findings in Coronary Insufficiency.—One hundred forty-seven patients with acute coronary insufficiency were observed. In approximately 60% the attack occurred spontaneously. In the rest, the attack was associated with acute gastric hemorrhage, effort, excitement, operation, tachycardia, acute gastroenteritis, or pulmonary infection. Six patients died during the acute attack. One hundred forty-one have been followed for from 6 months to 20 years; of these, 128 are alive, and 13 have died—a mortality rate of 9% (Table 5). This rate is one-third of that found in the patients with coronary occlusion. In 80 patients (57%) the heart was normal in size, and the electrocardiogram was normal (Groups 1A, 2A, and 3A). In the patients with coronary occlusion, the percentage with such normal findings was only 9.

Seventy-three (52%) of the coronary insufficiency patients made a complete functional recovery (Groups 1A and 1B). Sixteen (22%) of these have lived for more than 10 years after the episode, and 23 (31%) for more than 5 years. In 71% of the patients the size of the heart and the electrocardiogram findings were normal. The two-step exercise electrocardiogram was positive in six patients and negative in eight. The ballistocardiogram was positive in four patients and negative in the same number. In four patients a coronary occlusion developed later, and two others experienced another episode of coronary insufficiency from which they again recovered completely.

Among the patients who died subsequently three had made a complete functional recovery, one for 15 years and two for 1 year.

Fourteen of the patients had the attack of acute coronary insufficiency before they were 45 years old. All of them made a complete recovery. In only one did an abnormal electrocardiogram persist.

COMMENT

It is apparent that the prognosis in patients who survive an attack of coronary occlusion is much better than has generally been expected. In our series, almost two-fifths of the patients have made a complete functional recovery, and one-fourth of these have already lived for more than 10 years. In addition, a fair proportion of the patients (6.5%) made a complete functional recovery and lived for many years before dying of another acute attack of coronary occlusion or insufficiency. In fact, of the 180 who had recovered completely from the acute attack, less than 20% have died; only six patients died in less than five years. Our results indicate that a patient who makes a complete recovery from coronary occlusion has a 95% chance of living for more than 5 years, and a good chance of surviving for more than 10 years. Nevertheless, another occlusion or episode of acute coronary insufficiency may develop after many years.

The majority of our patients were seen in private practice. Therefore, our findings apply particularly to persons in the upper economic strata. In such patients coronary attacks are recognized earlier and treated with more care than in those in the lower economic group. However, a comparison of the findings in the ward and private practice patients demonstrated similar trends in both groups, and we believe that our findings hold for all classes of patients.

Of particular interest were the 26 patients who had made a complete functional recovery, and yet presented enlargement of the heart and advanced changes in the electrocardiogram (Group 1C). A definite ventricular aneurysm was present in 10; in the remainder there was usually paradoxical pulsation. The benign course of ventricular aneurysm in many patients is well known, and is borne out in our patients, many of whom lived more than 10 years and have been working. One of them, a physician, is quite well after 29 years. Only four patients in this group have died. The best prognostic guide following coronary occlusion appears to be the patient's symptoms, i. e., anginal pain or dyspnea, rather than the size of the heart or the electrocardiogram.

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A significant number of the remaining patients were idle voluntarily, because they thought that this was the proper course to pursue following coronary occlusion. Most of those who worked did full-time work at their previous jobs or professions or were engaged in somewhat similar work. It is true, of course, that many of them restricted their activities to some extent, or reduced the number of working hours, often on the advice of their physicians. For example, some physicians abandoned private practice, and took positions in industry or in teaching institutions.

From our findings it is clear that many persons who recover from a coronary occlusion are capable of resuming their places in all the various phases of industry. Many can perform their usual work, as do persons without coronary disease; others may have to find different work or to modify the work, as may be necessary. Periodic physical examinations of these patients, especially, should be made. In general, it is a good policy not to assign persons with coronary disease to jobs in which the sudden occurrence of anginal pain will endanger the lives of other persons.

Instead of discouraging patients who have recovered from a coronary occlusion from working, the physician should encourage them to resume some form of work as soon as this is physically possible. Most patients who make a complete functional recovery are able to return to work within three to six months after the attack; not infrequently they have done so before three months have elapsed. Psychologically, it is essential for these persons to be employed, because after a heart attack they usually develop considerable anxiety concerning their state of health. At times this becomes very serious and is far more damaging than is the cardiac disease itself. This state of mind may exist even in those who have made a complete functional recovery. Idleness merely exaggerates this tendency to anxiety and self-pity, whereas gainful employment serves to restore the patient's mental well-being. It is not uncommon to find that atypical chest pains and other symptoms disappear when these patients go back to work.

In considering the outlook following coronary occlusion, it is important to remember that the initial attack usually occurs after the age of 50; therefore, if a patient survives for more than 5 or 10 years, he will have approached his normal life span; and, since most survivors are able to work, relatively few working years will have been lost.

In our series, the patients in whom coronary occlusion developed before the age of 45 fared better than did those in the older age group, but the difference was less striking than had been expected.

The location of the infarct, whether anterior or posterior, did not play a role in the subsequent course of the life of the patients. The statement is not infrequently made, based merely on a clinical impression, that posterior infarction has a better prognosis during and following the acute attack. This opinion is not borne out in our series.

The patients who made a complete functional recovery following coronary occlusion not infrequently had a normal two-step exercise electrocardiogram, but usually had an abnormal ballistocardiogram. It must be remembered, however, that the ballistocardiogram is frequently abnormal in older persons without any evidence of heart disease. Therefore, the record must be evaluated with great care. The two tests often were not correlated. Following 100 attacks of coronary occlusion, Moser and his co-workers [7] found the ballistocardiogram normal in 20% of the patients. These patients had made a good functional recovery. We have occasionally encountered a normal test even in patients with ventricular aneurysm. An abnormal exercise electrocardiogram or ballistocardiogram may be the only objective evidence of coronary disease, or of a previous coronary occlusion.

As was to be expected, the patients with acute coronary insufficiency fared better than did those with coronary occlusion. More than half of these patients made a complete functional recovery, and over 95% of them are still living. The recognition of coronary insufficiency as an entity became common much later than did that of coronary occlusion; therefore, the follow-up period of patients who suffered from the former has been shorter than that of patients with coronary occlusion. Our findings suggest, however, that survival after an attack of coronary insufficiency is longer than that after coronary occlusion. Following complete recovery from coronary insufficiency, the heart size and electrocardiogram are normal in three-fifths of the patients.

The results of this follow-up study are of significance to the doctor, the patient and his family, and to industry. Coronary disease is the most frequent heart affection and the most important cause of illness; and it will continue to increase as a result of the lengthening life span and the greater numbers of middle-aged and old people in the population. Furthermore, a large number of persons who sustain a coronary occlusion are in the most active and productive period of their lives.

The general attitude to be adopted toward the future conduct of those who have survived an acute coronary occlusion or insufficiency constitutes a major economic and psychological problem of our time. In the past, the pessimism of both the physician and the lay person has led to a great deal of psychological and economic invalidism. This approach is no longer advisable. In view of the data which we now have, both the doctor and the patient may honestly confront coronary occlusion, before and after the attack, optimistically and positively. It should be emphasized that most patients survive the acute attack, and that many make a complete functional recovery and are able to resume gainful employment and approximate their normal life span. They should be encouraged to lead as normal lives as possible, avoiding excessive mental and physical strain. In this way we shall send many more patients back to a happy life rather than into the exile of invalidism and despondency.

CONCLUSIONS

A study has been made of the progress of 412 patients after acute coronary occlusion and 141 patients after acute coronary insufficiency. The patients were divided into groups on the basis of symptoms and activity and according to the objective findings.

7. Moser, M.; Pordy, L.; Chesky, K.; Taymor, R. C., and Master, A. M.: The Ballistocardiogram in Myocardial Infarction: A Study of 100 Cases, unpublished data.

About two-fifths of the patients with coronary occlusion have made a complete recovery. Another quarter of the patients made a satisfactory recovery, but experienced occasional angina with effort.

Twenty-five per cent of the patients who recovered completely have lived more than 10 years and 40% more than 5 years. Eighty-three per cent are employed, 60% at full-time work. Only three patients had diabetes; obesity was not common. Whether the infarct had been anterior or posterior did not influence the future course of the patient.

In 26 patients the size and pulsations of the heart and the electrocardiogram were normal. In some of these the two-step exercise electrocardiogram and ballistocardiogram were abnormal.

Twenty-six patients had recovered complete function although the heart was greatly enlarged and/or the electrocardiogram was very abnormal. In 10 patients definite evidence of ventricular aneurysm was present; one of these patients is well 29 years after the attack. Following coronary occlusion, the best prognostic guide appears to be the patient's symptoms rather than the objective findings.

Twenty-six additional patients made a complete functional recovery but died subsequently, the great majority after 5 or 10 years. Of all the patients who made a complete functional recovery, only six (3%) died in less than five years. The mortality rate in patients who made a complete recovery was less than half that found in those who continued to have symptoms.

Coronary occlusion or insufficiency may recur after many years of complete functional recovery. Such incidents occurred in 11 patients who again recovered completely.

Patients in whom the attack occurred before the age of 45 did only slightly better than did the older patients, as determined by the number who made complete recoveries and by the mortality rate.

The prognosis following acute coronary insufficiency was even better than that after coronary occlusion. Over half the former patients made a complete recovery and only 4% of them have died.

Following coronary insufficiency the size of the heart and the electrocardiogram are normal in three-fifths of the patients.

The majority of patients who survive an attack of coronary occlusion or insufficiency are able to lead fairly normal lives and to be gainfully employed. They should be encouraged to do so as soon as it is physically possible. In this way it will be possible to avoid much of the psychological and physical invalidism which now exists.

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OPERATION FOR CORONARY ARTERY DISEASE

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Operation for coronary artery disease was developed on dogs by Drs. Eugene Stanton, William Batiuchok, Eugene Leiter, Maurice Kim, and the authors of this paper.[1] The developmental problems in the surgical technique, however, will not be discussed in this paper. This operation introduces new problems in the physiology of circulation in the heart, and the answers to some of these problems cannot be given at the present time. The operation is giving fresh impetus to the study of circulation in the heart.

DESCRIPTION OF OPERATION

The operation is done in two stages. The first stage consists in the placement of a free vein graft between the coronary sinus and the aorta. The second stage of the operation consists of partial ligation of the coronary sinus at the ostium of the sinus into the right auricle. The purpose of the operation is to deliver oxygenated blood into the myocardium. We have evidence to show that oxygenated blood delivered into the venous system of the heart can protect the heart against occlusion of a major coronary artery.

The graft is taken from the basilic, cephalic or jugular vein either immediately before or on the afternoon before operation. The patient is placed on the right side. An intercostal incision is made between the left seventh and eighth ribs. The pericardium is opened. Two pieces of polyacrylonitrile fiber ("orlon") are placed around the coronary sinus at a point where the sinus enters the right auricle. Polyacrylonitrile fiber is used because it maintains its tensile strength after having been in the body several weeks. These polyacrylonitrile threads are tucked away between the pericardium and heart to be used at the second stage of the operation. A special clamp is placed on the coronary sinus, and the sinus is opened about 5 mm. One end of the vein graft is sutured to the sinus, and the clamp is removed from the sinus. A site for tapping the aorta is selected, and a special clamp is applied to the aorta. The aorta is opened approximately 4.5 to 5.0 mm. The free end of the vein graft is sutured to the aorta. The clamp is removed from the aorta. The pericardium is closed by sutures. The chest wall is closed. The first stage of the operation can be done in approximately two and one-half hours.

This work was supported by grants from the United States Public Health Service and the Cleveland Heart Society.

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Read before the Section on General Practice at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

1. (*a*) Beck, C. S.; Stanton, E.; Batiuchok, W., and Leiter, E.: Revascularization of Heart by Graft of Systemic Artery into Coronary Sinus, J. A. M. A. **137**: 436 (May 29) 1948. (*b*) Beck, C. S.: Revascularization of the Heart, Ann. Surg. **128**: 854 (Oct.) 1948. (*c*) Beck, C. S.: Revascularization of the Heart, Surgery **26**: 82 (July) 1949. (*d*) McAllister, F. F.; Leighninger, D., and Beck, C. S.: Revascularization of the Heart by Vein Graft From Aorta to Coronary Sinus, Ann. Surg. **133**: 153 (Feb.) 1951.

The second stage of the operation is done three weeks after the first stage. The scar of the first stage is incised, and the chest is opened. The pericardium is opened. The polyacrylonitrile threads are picked up and freed to the point where they encircle the sinus. A probe measuring 2 mm. in diameter is placed on the sinus, and the polyacrylonitrile thread is tied on the probe. The probe is removed. This produces partial occlusion of the sinus. The pericardium is closed. The chest wall is closed. The second stage of the operation can be done in one and one-half hours.

OBSERVATIONS AT OPERATION

The first stage of the operation provides a fistula from the aorta through the graft and into the coronary sinus. Most of the blood escapes into the right auricle. The flow is rapid as in an arteriovenous fistula elsewhere. A thrill is palpable over the graft. In several patients with coronary artery disease pink blood could be seen in the veins on the posterior aspect of the heart at the first stage of the operation. This pinkening of the venous system became more marked if the sinus were occluded temporarily by the polyacrylonitrile threads. This observation was not made in normal dogs with normal coronary artery inflow. The explanation for this is not given, but the suggestion is made that in patients the pressure in the venous system of the heart might be reduced by the coronary artery inflow disease. A reduced pressure in the venous system should encourage retrograde flow from the coronary sinus into its venous tributaries. The presence of coronary artery disease, therefore, is favorable to retrograde flow in the veins and in this respect to the success of the operation in patients.

TESTS OF BENEFIT FROM OPERATION

Before this operation was applied to patients with coronary artery disease, it was necessary to test the benefit on dogs provided by operation. The test worked out by Beck and his associates in the 1932 to 1942 period consisted of ligating the descending ramus of the left coronary artery at its origin in one step. The artery was dissected. No branches were missed. Aseptic technique was used, and the delayed deaths occurring weeks later were included. Among normal dogs the mortality rate from this ligation was 70%, and the recovery rate was 30%. All dogs that lived after ligation of the artery showed a definite infarct in the heart. In most specimens the infarct was large. Mortality and infarction provided a basis on which benefit could be determined.

The test was applied to 37 dogs in which arterial blood was directed into the coronary sinus and in which the coronary sinus was either completely or partially ligated at its ostium in the right auricle. The source of the arterial blood was either from the carotid artery or from the aorta by way of the vein graft. In this group of 37 dogs, 33 lived and 4 died after ligation of the test artery.[2]

For comparison the test ligation was done in 10 dogs in which the graft was occluded by thrombosis. These experiments were identical to the others except that the graft was not patent. Seven dogs died and three recovered. This is the same mortality rate as occurred in our series of normal control dogs. In this series the mortality was 70% and the recovery rate 30%.[3] On the basis of 37 control dogs, there would have been 11 that lived and 26 that died after ligation of the test artery.

The destruction of heart muscle was equally significant. The infarcts in the control group were always definite and frequently extensive, involving the entire thickness of the ventricular wall. A gross infarct was present in every specimen in the control group. Among the dogs with patent graft a gross infarct was absent in over half the specimens. In most of the other specimens the amount of destruction was limited to rather small areas. It was also possible to make these ligations without significant changes in the electrocardiogram.[4]

According to these experiments, the operation protects the dog against death and destruction of heart muscle after ligation of the descending ramus of the left coronary artery. Protection against death and infarction are the two factors on which this operation is based. It seems reasonable to assume that oxygenated blood must enter the capillary bed of the myocardium where oxygen exchange is possible. If this does not occur, how could this protection be explained? This is only indirect evidence that blood enters the capillary bed, but it appears to be the only assumption that can be made.

It might be stated that additional coronary arteries were ligated, and the dogs were active and appeared in good health.[2] In two dogs all coronary arteries were occluded except the septal branch. In one dog all coronary arteries were occluded except the circumflex artery, which was occluded to a lumen of 1.5 mm. We did one experiment in which all coronary arteries were occluded, and the heart kept beating for 35 minutes. There was considerable mortality in accomplishing these extensive occlusions, but the fact remains that it was possible to make them. In our opinion such occlusions as these are not possible in the normal unprotected heart.

Additional evidence that blood flows in a retrograde direction and probably through the capillary bed is given by the following experiment, which was repeated in several cases. The circumflex artery is dissected free, and the proximal end is ligated in a dog in which both stages of the operation have been done previously. The flow from the distal end of the severed artery is observed. When the graft from the aorta to the coronary sinus is clamped off, this blood from the severed artery is red and flows in small amount. It is arterial blood which, no doubt, enters the circumflex artery from other coronary arteries by way of intercoronary channels. When the graft is open so that red blood enters the sinus from the aorta, the retrograde flow from the severed circumflex artery is blue. It flows in large amount and can build up a higher

2. Hahn, R. S., and Beck, C. S.: Revascularization of the Heart: A Study of Mortality and Infarction Following Multiple Coronary Artery Ligation, to be published.

3. (a) Stanton, E. J.; Schildt, P., and Beck, C. S.: The Effect of Abrasion of the Surface of the Heart Upon Intercoronary Communications, Am. Heart J. **22**: 529 (Oct.) 1941. (b) Beck, C. S., and Mako, A. E.: Venous Stasis in the Coronary Circulation: An Experimental Study, Am. Heart J. **21**: 767 (June) 1941. (c) Schildt, P.; Stanton, E., and Beck, C. S.: Communications Between the Coronary Arteries Produced by the Application of Inflammatory Agents to the Surface of the Heart, Ann. Surg. **118**: 34 (July) 1943.

4. Leiter, E.: The Electrocardiogram Following Anastomosis of Carotid Artery to Coronary Sinus, Am. Heart J. **39**: 125 (Jan.) 1950.

pressure. This observation was first made by one of us (R. S. H.) in our laboratory. The retrograde flow is augmented because of aortic inflow from the graft. It is blue because the oxygen has been taken out, and in order for this to occur, it must have traversed a capillary bed where oxygen exchange is possible. We believe that this is strong evidence, together with the protection against mortality and infarction, that red blood can traverse the capillary bed in a retrograde direction where it is beneficial. Along with this increased retrograde flow from the graft, there is some electrocardiographic evidence of improvement when the graft is open.[5]

SIDE EFFECTS OF OPERATION

The operation involves an arteriovenous fistula by leaving the ostium of the coronary sinus partially open. In our experiments the sinus was reduced to a lumen of approximately 3.0 to 3.5 mm. In patients with coronary artery disease the lumen was reduced to about 2 mm. A considerable quantity of blood can flow through such an opening, but it would appear that the flow is not great enough to produce clinical manifestations of a fistula, except a murmur. This aspect of the operation will bear further observation. One might expect the development of an extensive drainage by way of the anterior cardiac veins and the middle cardiac vein. The anterior cardiac veins enter directly into the right auricle.[6] The middle cardiac vein enters the coronary sinus between the polyacrylonitrile fiber ligature and the auricle so that it is not partially occluded. In some specimens this vein enters directly into the right auricle. Our observations on venous drainage are based on the experimental work. We expected to find large drainage channels. In general, these drainage channels did not appear to become an important run-off for blood. Our experience to date is that the arteriovenous fistula effect has not been a problem, but it remains a subject for study in patients.

There were three complications which could have prevented the satisfactory outcome of the operation. These were (1) hemorrhage into the heart muscle, (2) thrombosis in the graft, and (3) intimal thickening of the veins of the heart. All three of these complications were solved in the same way, namely, by making the operation into a two-stage procedure and by providing an exit for blood by only partially occluding the coronary sinus.[1d] A stagnant flow of blood must be avoided. The flow through the graft and veins must be active. The walls of the veins thicken after they are exposed to the increased pressure produced by the first procedure of the operation, and the veins tolerate the pressure satisfactorily when the pressure is further increased by the second procedure. After the veins have been exposed to the pressure of arterial inflow, they take on the appearance of the arteries.[7]

5. Hahn, R. S.; Beck, C. S., and Kim, M.: Revascularization of the Heart: Some Studies on the Mechanism of Benefit Following Arterialization of the Coronary Sinus in Dogs, to be published.

6. McAllister, F. F., and Leighninger, D. S.: Infarction of the Right Ventricle Caused by Multiple Coronary Vein Ligation, Circulation 1: 717 (April) 1950.

7. Hahn, R. S., and Kim, M.: Revascularization of the Heart: Observations on the Histological Modification of the Dog Heart Following Arterialization of the Coronary Sinus, to be published.

8. The protocols on the early series of cases are omitted from THE JOURNAL because of limitation of space. They will appear in the authors' reprints.

APPLICATION TO PATIENTS WITH CORONARY ARTERY DISEASE

This aspect of the work is divided into an early and a late period. In the early period, dating approximately from January, 1948, to December, 1950, only patients who were entirely or almost entirely incapacitated from work were accepted for operation. These patients had extensive and irreversible damage in the heart. No doubt most of them were poor risks for any operation, and, indeed, the damage in the heart muscle in some of these patients was such as to make questionable the degree of benefit that might have taken place if the patient had recovered from the operation. In this group of 12 patients there were eight deaths and four recoveries. Another factor in the mortality in this group, aside from extensive disease, was the technical aspects of the operation. Regardless of experimental background, the operation on patients had still to be developed. There were problems which had to be solved, and experience was necessary for their solution.

In addition to the mortality in this group of advanced cases,[8] there were several additional deaths. One patient died in the hospital while preoperative studies were being carried out; no operation was done. Several patients died during the few days it took to have them admitted to the hospital. One patient died during a test anesthetic procedure without operation. It is obvious that the patients whom we accepted for operation had severe disease. They were not good candidates for operation. The risk was great, and if the patient survived the operation, the amount of damage already in the heart probably could impair the clinical result. Concerning this aspect of the problem, an important contribution was made by Drs. George Geckeler and Charles Bailey, of Philadelphia. They urge that we accept stronger patients for operation and refuse to accept patients who are severely incapacitated. They pointed out that it probably would not be possible to establish this operation if we accepted bad-risk patients. In this event, it would not be possible to give to the better-risk group of patients with coronary artery disease the potential benefit that the operation carries. Therefore, we decided not to accept for operation patients who were (1) totally incapacitated, (2) had an enlarged heart, (3) had heart failure, (4) had severe disease in the aorta, or (5) had a systolic blood pressure higher than 160 mm. of mercury. The record improved. We deviated from this program after we had a record of one death out of 19 patients operated on and accepted several patients who were incapacitated. We learned again that such patients are not satisfactory candidates for the operation.

REPORT OF CASES

CASE 1.—G. P. a man, 51, was operated on Jan. 31, 1951. The posterior aspect of the left ventricle showed an infarct 4 to 5 cm. in diameter. The common left coronary artery was palpable. The descending and circumflex arteries were palpable. These arteries felt as though they were calcified. Because of the extensive disease in the heart, he was classified as a "bad risk patient." The graft was placed between the coronary sinus and the aorta without difficulty. Blood pressure was well maintained. Two polyacrylonitrile threads were placed around the ostium of the sinus. These were not tied. The veins on the posterior surface of the heart became pink when the coronary sinus was temporarily occluded. There was an immediate inflow of red blood into the veins. Operation was again done Feb. 22,

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1951. The coronary sinus was partially occluded to a lumen of 2.5 mm. There was a slight pinkening of the veins after this was done. This patient states that he has been completely free of pain and has taken no medicament since operation. He is enthusiastic about the result.

CASE 2.—H. F., a woman, 41, was operated on Jan. 17, 1951. Both major branches of the left coronary artery were palpable and seemed to be calcified. The graft was placed without difficulty. After the anastomosis was completed, a flash of red blood could be seen in the veins with each systole. Temporary occlusion of the sinus pinkened the veins. Operation was done again Feb. 7, 1951. The coronary sinus was ligated at the ostium to about 3 mm. The veins were pink after this was done. The patient went through both operations satisfactorily. She had episodes of heart failure before operation. She reports favorably on the result and claims that since the operation she has had no anginal pain and that her activities have increased.

CASE 3.—G. G., a man, 42, was operated on Jan. 22, 1951. He was placed in the bad-risk group. He had practically no tolerance for exercise and was taking considerable morphine. The graft was placed without difficulty. The veins became pink when the sinus was temporarily occluded. Operation was done again Feb. 19, 1951. The sinus was occluded to a diameter of 2.5 mm. A murmur was heard. It is difficult to evaluate the result in this patient. He thinks he is better, but he is not strong and remains an invalid. Additional time will be necessary before evaluation can be made.

CASE 4.—F. S., a man, 59, was operated on Feb. 1, 1951. The descending and circumflex arteries were palpable and probably calcified. The graft was placed without difficulty. It was patent. Temporary occlusion of the sinus pinkened the veins. It also stopped the heart momentarily. No murmur could be heard after the operation. Exploration was done Feb. 23, 1951. The graft was thrombosed. The surface of the heart and the parietal pericardium were gently abraded, and 0.2 gm. of powdered asbestos was applied to these surfaces. This patient had not worked for eight months. He is now planning to return to work. He has pain in his incision. The result cannot be evaluated yet.

CASE 5.—M. S., a man, 46, was operated on Feb. 13, 1951. The descending and circumflex arteries were easily palpable. The graft was placed without difficulty. A good retrograde flow in the veins occurred when the sinus was temporarily occluded. Not only did the veins become pink, but the heart muscle did also. Operation was done again March 6, 1951. The sinus was occluded to a diameter of 2 mm. There was a flash of pink blood into the veins with each systole. The patient was seen May 18. A murmur was present. This patient returned to work. He states that he has had no pain and has taken no medicament since operation. He is highly pleased with the result.

CASE 6.—R. L., was a man, 43. The first step of the operation was done April 2, 1951. A graft of vein was placed between the coronary sinus and the aorta. The veins became pink when the sinus was temporarily occluded. The second stage was done April 20, 1951. The patient is free of pain and has returned to work. He is enthusiastic about the result.

CASE 7.—J. P., was a man, 44. The first stage of the operation was done May 5, 1951. Small ecchymotic spots appeared in the epicardial fat when the sinus was momentarily occluded. This was probably due to rupture of capillaries, and the observation suggests that the capillaries could not tolerate a high retrograde venous pressure. The second stage was done June 1, 1951. It was interesting that the heart tolerated several tests of complete sinus occlusion. The sinus was occluded to a lumen of 3 mm. The patient tolerated the operation well. This patient has had no pain and has taken no medicament since operation. He has returned to work. He is enthusiastic about the result.

CASE 8.—M. F., a man, 44 was operated on Dec. 11, 1950.[9] An infarct was found on the posterior aspect of the left ventricle. A vein graft was placed between the coronary sinus and the aorta. The second stage of the operation was done January 4, 1951. The sinus was partially occluded. The patient has had no angina since discharge. He returned to work on March 5 and is working full time for the first time since January, 1950. His heart is normal size, and the murmur can easily be heard. His electrocardiogram, while not normal, is better than any during the six months preceding surgery.

CASE 9.—H. F. was a women, 48. In April, 1950, she was hospitalized with anterior and posterior myocardial infarction. Operation was done Dec. 12, 1950. A vein graft was placed between the coronary sinus and the aorta. There was a good thrill and pulsation over the graft. The systolic murmur heard after operation gradually disappeared before the second stage was done on Jan. 5, 1951. At this operation a large amount of clotted blood was found in the chest, and there was evidence of a low-grade infection. The graft was not patent. The coronary sinus was ligated. A report several months after operation stated that the patient has had very little angina and is more active than before operation. She has a grade I murmur, but there has been no recanalization.

CASE 10.—E. T., a woman, 45, was operated on Dec. 12, 1950. The basilic vein was not satisfactory, and a segment of anterior malleolar vein was used. The graft was smaller than usual. When the sinus was temporarily occluded the veins in the heart became pink. The second operation was done Jan. 3, 1951. The graft was thrombosed. There was no murmur. An attempt was made to place another graft between the sinus and the aorta, but we did not succeed in doing this. According to subsequent report, the patient's condition is about the same as before operation.

CASE 11.—C. K. was a man, 58. Operation was attempted Dec. 13, 1950. The patient was almost incapacitated. He had an enlarged heart and a dilated and tortuous aorta. Diffuse infarction was visible in the posterior part of the left ventricle. The descending and circumflex coronary arteries were readily palpable and were calcified. The heart beat was weak; the systolic pressure was 70 mm. of mercury. Despite the use of phenylephrine (neo-synephrine®), the pressure could not be maintained. Ventricular fibrillation developed, and the patient died. This patient was not a satisfactory condidate for operation. Extensive disease was present in the heart and aorta.

CASE 12.—S. A., a man, 40, was operated on Feb. 21, 1951.[10] On the posterior aspect of the left ventricle several small infarcts were observed about 0.5 to 1.0 cm. in diameter. The descending ramus of the left coronary artery was easily palpable and probably calcified. A vein graft from the arm was placed between the coronary sinus and the aorta. The veins became pink when the sinus was temporarily occluded. The second stage was done March 15, 1951. The ostium of the sinus was ligated to a diameter of 2.5 mm. This patient has returned to work. He is almost completely free of pain and takes no medicament. He is pleased with the result.

CASE 13.—R. B. was a man, 36. Clinically he had two infarcts, one anterior and one posterior. Operation was done Feb. 26, 1951. An initial fall in blood pressure delayed the operation 30 minutes. A posterior infarct about 3 cm. was observed. The circumflex artery was easily palpable and was probably calcified. A graft from the cephalic vein was placed between the coronary sinus and the aorta. The veins filled with pink blood when the sinus was temporarily occluded. The second stage was done March 26, 1951. The operation was delayed 45 minutes because of low blood pressure. The sinus was partially ligated to 2 mm. Pink blood was observed in the veins. The patient had severe damage in the heart. He was incapacitated, and the prognosis was bad. Since operation he has been almost completely free of pain and has returned to work. He takes no medicament. He is pleased with the result.

CASE 14.—W. M., a man, 59, was operated on March 5, 1951. A segment of vein was taken from the elbow and placed between the coronary sinus and the aorta. The parietal pericardium was adherent to the heart. These adhesions were separated. The second stage was done March 27, 1951. There was no pulsation in the graft. It was occluded by thrombosis. The sinus was completely ligated, and 0.2 gm. of powdered asbestos was placed between the pericardium and the heart. Several weeks after operation the patient coughed up blood and later had a severe pulmonary hemorrhage. The patient died from the hemorrhage.

9. The operations in Cases 8 through 11 were done at Permanente Hospital, Oakland, Calif. Dr. Cecil Cutting and Dr. David DeKruif studied and reported on these cases.

10. The operations in Cases 12 through 16 were done at the Veterans Administration Hospital, Cleveland. Dr. Harold Schwartz aided us in this study.

Examination showed that the graft had become recanalized and that it ruptured in three areas where it was adherent to the lung. The explanation for this cannot be given. The coronary arteries showed minimal or no disease. Probably the pericarditis was a factor in producing electrocardiographic changes. The graft showed necrosis and inflammation.

CASE 15.—J. W., a man, 56, was operated on April 16, 1951. A vein graft was placed between the coronary sinus and the aorta. The veins filled with pink blood when the sinus was temporarily occluded. On May 7, 1951, the sinus was partially occluded. The veins became pink, as also did the myocardium. About four hours after the operation was completed, the systolic blood pressure rose to 200 mm. of mercury and a left hemiplegia was noticed. The patient died the following day. Autopsy showed the graft to be patent. The sinus was partially occluded. The coronary arteries were severely diseased, partially occluded, and calcified. Generalized fibrosis was found in the myocardium. A pituitary adenoma was found. Ischemic necrosis of the right cerebral cortex was found without occlusion of cerebral arteries or the carotid artery. The cardiac end of the stomach showed extensive ischemic necrosis with perforation. This was an acute process probably related to the pituitary tumor. There was some subepicardial hemorrhage in the heart muscle, which probably occurred when the systolic blood pressure rose to 200 mm. of mercury several hours after the operation was completed.

CASE 16.—L. F., a man, 42, was operated on April 19, 1951. The blood pressure fell to a critical level. The incision was delayed. The systolic pressure rose to about 90 mm. of mercury, and the chest was opened. The pericardium was opened. A large infarct was seen on the posterior surface of the left ventricle. The heart was not touched. The systolic pressure fell to 60 mm. of mercury, and the beat was weak. The blood pressure did not rise, and it was decided to close the chest and not to proceed with the operation. The patient died the following day. He had severe disease in the heart and was incapacitated. He was not a satisfactory candidate for operation.

CASE 17.—J. C., a man, 42, was operated on Jan. 31, 1951.[11] The common left coronary artery could be palpated and was probably calcified. A vein graft was placed between the coronary sinus and the aorta. The patient was improved clinically after this operation. He felt so well that he did not believe the second stage was necessary. The second stage of the operation was done Feb. 28, 1951. The coronary sinus was ligated down to 2.5 mm. Immediately after this was done, the venous oozing from the surface of the heart changed to pink blood. The veins became pink, as also did the heart muscle. A murmur could be heard. This patient has returned to work, has had no pain, and takes no drugs. Recently he walked 4 miles. Before operation he could walk about a city block.

CASE 18.—W. C., a man, 44, was operated on Feb. 28, 1951. An infarct was seen on the posterior surface of the left ventricle. It was adherent to the parietal pericardium. The circumflex coronary artery was palpable and was probably calcified. An attempt was made to make an anastomosis between the coronary sinus and the graft of vein. In doing this the sinus was torn. The sinus was ligated. The epicardium and the lining of the parietal pericardium were gently abraded, and 0.2 gm. of powdered asbestos was applied to these surfaces. The patient believes that this pain has been definitely lessened by the operation.

CASE 19.—A. A., a man, 38, was operated on March 21, 1951. The descending ramus of the left coronary artery could be palpated and was probably calcified. A graft of vein was placed between the coronary sinus and the aorta. When the ostium of the sinus was temporarily occluded, the veins of the heart became pink. The second stage of the operation was done April 11, 1951. The graft was occluded by a thrombus. The epicardium and parietal pericardium were abraded, and 0.2 gm. of powdered asbestos was applied to these structures. The patient has been discharged from the hospital, but no statement can be made concerning the benefit of the operation.

CASE 20.—J. T., a man, 42, was operated on March 21, 1951. Areas of infarction were seen on the posterior surface of the left ventricle. The descending ramus of the left coronary artery was easily palpable and was probably calcified. The disease in the heart seemed to be extensive. A graft of vein was placed between the coronary sinus and the aorta. The veins became pink when the sinus was temporarily occluded. The second stage of the operation was done April 11, 1951. The coronary sinus was partially ligated to a lumen of 2 mm. The veins of the heart became pink, as also did the color of the heart. Venous oozing immediately became pink oozing from the surface of the heart. This patient's pain has not completely disappeared, but he states that he feels definitely better. He has some incisional pain. He can walk three city blocks; whereas, before operation approximately one-half block was as far as he could go. Before operation this patient had some acute attacks of coronary insufficiency.

CASE 21.—W. K., a man, 39, was operated on April 11, 1951. The systolic blood pressure fell to 80 mm. of mercury as the chest was being opened. The operation was discontinued for a period of time until the pressure rose to a higher level. A large infarct, measuring 5 cm. in diameter, was observed on the posterior aspect of the right ventricle. Small areas of fibrosis were seen elsewhere. Both the descending and circumflex coronary arteries were palpable and probably calcified. A vein graft was placed between the coronary sinus and the aorta. The heart beat was rapid. The operation was completed. The patient died five hours after the operation was completed. This patient had episodes of failure and paroxysmal auricular tachycardia with premature auricular contractions. He had been taking quinidine and digitalis. He was a bad risk, and, as it turned out, he was not a satisfactory candidate for the operation.

CASE 22.—S. C., a man, 53, was operated on May 2, 1951. An infarct was present on the posterior aspect of the left ventricle. It appeared to be extensive. He had a bundle-branch block. No attempt was made to place the graft because the sinus lay to the right of the aorta. The anatomical relationship appeared to be such that a patent graft might not be obtained. The surface of the heart and the lining of the parietal pericardium were gently abraded, and 0.2 gm. of powdered asbestos was applied to these surfaces. It is too early to evaluate the result.

CASE 23.—M. C., a woman, 53, was operated on May 2, 1951. A graft was placed between the coronary sinus and the aorta. The second stage was done May 30, 1951. The graft was not patent. The epicardium and lining of the parietal pericardium were abraded, and 0.2 gm. of powdered asbestos applied.

CASE 24.—W. S., a man, 53, was operated on May 30, 1951. A graft of vein was placed between the coronary sinus and the aorta. The second stage is yet to be done.

CASE 25.—A. D., a man, was operated on Jan. 30, 1951.[12] A graft of vein was placed between the coronary sinus and the aorta. The second stage was done March 1, 1951. The graft contained a recent thrombus. The graft was opened, and the thrombus was removed. The incision in the graft was closed by sutures. Blood flowed through the graft from the aorta. The coronary sinus was partially occluded to a diameter of 3 mm. This patient is reported to have shown marked clinical improvement.

CASE 26.—A male dentist, 41, was operated on March 1, 1951. An extensive old infarct was found on the posterior surface of the left ventricle. Most of the visible heart muscle showed diffuse fibrosis. Both major branches of the left coronary artery were palpable and probably calcified. There was an initial fall in blood pressure. The graft was placed between the coronary sinus and the aorta. The second stage of the operation was done March 22, 1951. The coronary sinus was partially occluded to a diameter of 2.5 mm. The veins in the myocardium became pink. This patient gave a favorable report on the result. His activity has increased, and his color has improved. He has no "icy sweats." He is thinking about returning to his practice. This patient had a severely damaged heart.

CASE 27.—This woman, 51, was operated on March 22, 1951. There was an initial fall in blood pressure. An infarct was found in the posterior aspect of the left ventricle about 3 cm. in diameter. The heart was enlarged and had a sluggish beat. A graft of jugular vein was placed between the coronary sinus and the aorta. The veins became pink when the sinus was occluded. The postoperative course was complicated by recurrence of

11. The operations in Cases 17 through 24 were done at St. Michael's Hospital, Newark, N. J. Drs. N. A. Antonius, John McGuire and Anthony D. Crecca aided us in this study.

12. The operations in Cases 25 through 28 were done at Hahnemann Hospital, Philadelphia. Drs. George Geckeler and Charles Bailey aided us in this study.

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angina decubitus, probably an occlusion of another small coronary artery, an episode of 2: 1 auriculoventricular block, and gallop rhythm. The second operation was done May 31. A murmur was readily heard, and it was believed that the graft was patent. However, the graft was occluded by thrombosis. Nothing further was done to the heart because of the risk.

CASE 28.—H. R., a man, 48, was operated on May 31, 1951. A large infarct was present on the posterior aspect of the left ventricle. The pericardium was adherent to this infarcted area. A graft of vein was placed between the coronary sinus and the aorta. When the coronary sinus was temporarily occluded, the veins in the heart became pink. Venous oozing from ventricles also became pink. The operation was well tolerated.

COMMENT

In this series of 28 patients there were 23 recoveries and 5 deaths, a mortality rate of 18%. Four of the five patients who died had advanced degenerative disease. These patients were completely or almost completely incapacitated. The fifth patient who died had unexplained necrosis of the graft, a complication which we had not observed. This patient had little or no coronary artery disease; extensive adhesions between the heart and pericardium were present. It is possible that a latent infection was activated. Of the 23 patients who recovered, 13 had both stages of the operation, and 2 had only the first stage. Of the remaining eight patients, the graft was thrombosed in six and not placed in two. In several of these eight patients the alternate operation was done. This consisted of abrasion of the heart and pericardium with application of a chemical irritant to produce intercoronary communications.[3a]

The period of time is not sufficient to enable us to make clinical evaluation of these patients. So far the results appear to be or actually are favorable. A number of patients are nothing less than enthusiastic about the result. They get satisfaction in describing their improvement and urge other patients to have the operation done. The importance of scientific measurement of the results is recognized and will be carried out. In making clinical appraisal one can err in either direction, and this is to be avoided. Both time and additional experience are necessary to determine the benefit of this operation on patients.

CONCLUSIONS

In conclusion, several comments can be made. The development of this operation required years of experimental work. The benefit of the operation has been tested and measured on dogs. The benefit is, indeed, significant. The application to patients has been made with considerable mortality among bad-risk patients but with a more acceptable mortality among patients who are not completely incapacitated. The operation on patients has not been completely developed. The problem of thrombosis exists in some cases. No doubt this problem can be overcome. Another problem is to determine the results in patients and to find out whether the benefit to the dog can be transferred to the patient with coronary artery disease. In order to do this, the operation will have to be done on additional patients.

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AGE AND SURVIVAL IN CASES OF ACUTE MYOCARDIAL INFARCTION

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For the elderly patient with acute myocardial infarction a poor prognosis is frequently made by his attending physician, even when an uneventful recovery appears to be in progress. It is not clear whether this attitude is based on sound clinical and statistical experience or originates from the defeatism that has long been associated with treatment of the aged. It is true that crude statistics have shown that the mortality rate from acute myocardial infarction increases among those of advancing years. Woods and Barnes [1] observed the death rate to be twice as great among those beyond 60 as among those below; Rathe,[2] in his analysis of a series of cases, concluded that a poor prognosis is indicated when the patient is over 55. Hellmuth,[3] Levine and Brown [4] and others also confirmed the observation that the prognosis of an acute attack of myocardial infarction becomes progressively more serious as the patient increases in age.

Such statistical differences, however, could be due simply to a higher incidence of severe attacks in later life, rather than to a specific influence of age on survival in the individual case. At the time of writing no evidence could be found in the literature to justify the common belief that a patient over 60 has a greater chance of dying from acute myocardial infarction than a younger patient who has sustained an attack of similar severity. Thus, unwarranted conclusions may have been drawn from random comparison of mortality rates, without correction for differences in severity of attacks, clinical signs, or incidence of previous myocardial damage. Obviously, similar cases in different age groups must be compared if a true concept is to be formulated regarding the elderly patient's relative capacity for survival. The

In conjunction with the Medical Services of Kings County and Maimonides Hospitals, Brooklyn.

Read at the First National Meeting of the American College of Cardiology, New York, Oct. 6, 1951.

A joint project with the National Heart Institute, United States Public Health Service, Washington, D. C.

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data derived from such comparison would establish whether or not the statistical correlation of age with group prognosis reflects a similar age influence on survival in the individual case.

From the concept recently introduced by Dock,[5] it would appear that involutionary changes in the myocardium might be responsible for the higher mortality rate in elderly subjects with acute cardiac infarction. According to this view, senile deterioration of the myocardium occurs independently of coronary atherosclerosis and is an important factor in the precipitation of heart failure in patients over 50. A higher incidence of congestive failure accompanying acute myocardial infarction in older subjects, however, affords no proof that this complication is less ominous when it occurs under similar circumstances in younger patients. Since bedside evaluation of prognosis is largely dependent on the presence or absence of serious signs and symptoms, the clinician should know whether or not the significance of these criteria is altered by the element of age.

In an attempt to answer this question, age and mortality were studied in a group of 1,047 cases of acute myocardial infarction in which consideration was given,

TABLE 1.—*Analysis of 1,047 Cases of Acute Myocardial Infarction According to Age and Severity of Attack*

	Total	"Good Risk"	"Poor Risk"
All ages	1,047	489 (46.7%)	558 (53.3%)
Under 60	618	331 (53.6%)	287 (46.4%)
60 or over	429	158 (36.8%)	271 (63.2%)

TABLE 2.—*Mortality Rate in 1,047 Cases of Acute Myocardial Infarction According to Age and Severity of Attack*

	Total	"Good Risk"	"Poor Risk"
All ages (%)	33.4	3.1	60.0
Under 60 (%)	28.8	3.9	58.5
60 or over (%)	40.1	3.2	61.6

in each instance, to the severity of the attack, the occurrence of previous cardiac infarction, and the presence of specific clinical signs. From the findings observed during the first 24 hours of hospitalization, our cases were classified as "good risk" or "poor risk," and the effect of age on subsequent mortality was evaluated in each of the two categories. The following criteria were enumerated in order to identify patients who had sustained a severe attack or who for other reasons warranted a poor prognosis: (1) previous myocardial infarction, (2) intractable pain, (3) severe degree or persistence of shock, (4) significant enlargement of the heart, (5) gallop rhythm, (6) congestive heart failure, (7) auricular fibrillation or flutter, ventricular tachycardia or intraventricular block, and (8) diabetic acidosis or other serious complicating diseases. Patients who showed none of these symptoms on the first day of hospitalization were classified as "good risks" to distinguish them from the "poor risk" patients who manifested one or more of these unfavorable prognostic signs.

COMPOSITION OF SAMPLE

The material was derived from three independent sources, the United States Public Health Service Hospital in Staten Island and the Maimonides and Kings County Hospitals in Brooklyn. An analysis was made of 1,047 patients consecutively admitted for acute myocardial infarction, of which 201 were treated at the United States Public Health Service Hospital, 223 at Maimonides Hospital, and 623 at the Kings County Hospital (State University, College Division). In every instance the clinical diagnosis of acute myocardial infarction was confirmed by one or more electrocardiograms. The age range for the entire series was 30 to 88 years, with a mean age of 56.7 years. The average age for the 618 patients under 60 was 51.5 years as compared with 67.4 years for the 429 patients 60 or older. The difference between the mean ages of these two groups was therefore 15.9 years. In the entire series there were 843 men and 204 women. The average age for the men was 56.0 years while that for the women was 60.0 years. When the male and female groups were analyzed separately, the average age for those under 60 and those 60 and over was found to be almost identical for the two groups. The crude death rate during the period of hospitalization was computed for the entire series and then for patients in each of the two component age groups. Comparison was then made between the mortality rates among the "good risk" cases and the "poor risk" cases in these two age groups. A similar breakdown of data was undertaken for the male and female groups. All of the patients in this study were treated by conservative means without the use of anticoagulants.

RESULTS

The mortality rate in 618 subjects under 60 was 28.8%; whereas, the mortality rate in 429 subjects 60 or older was 40.1% (Tables 1 and 2). These findings, therefore, confirm previous observations which recorded a statistical correlation of age with group prognosis. On the other hand, the mortality rate among 331 "good risk" patients under 60 was 3.0% while that among 158 similar patients 60 or older was almost identical—3.2%. An analysis of mortality among "poor risk" patients also failed to reveal that age is a significant factor in the outcome of the individual case. Thus, among 287 patients under 60 who showed unfavorable criteria for recovery on the first day of admission, the mortality rate was 58.5% as compared with 61.6% among 271 older patients who also showed poor prognostic signs. This small difference in death rate is not believed to be significant in view of the greater incidence of critical cases in the older "poor risk" group. Separate analysis of the data according to sex showed that among both men and women age plays no part in determining the outcome of the individual case once the attack has developed.

COMMENT

The analysis presented confirms previous observations which have indicated that the mortality rate from acute myocardial infarction is elevated among persons past middle age. It appears to show, however, that this increase in mortality is mainly the result of a higher incidence of serious attacks among those in the later decades of life. Thus, in our series 46.4% of the patients under 60 presented serious prognostic signs at the beginning of their clinical attack as compared with 63.2% of those 60 or older (Table 1). It appears unlikely that this difference results from greater impairment of coronary circulation in old age. The incidence of previous attacks of myocardial infarction was actually slightly less in our older age group. Moreover, the frequent observation that the aorta and coronary arteries are remarkably free from significant atherosclerotic change in elderly patients suggests that absence of severe athero-

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sclerosis of the coronary vessels may be a prerequisite to the attainment of old age. It has been postulated that senile deterioration of the myocardium is an important factor in the precipitation of heart failure in patients over 50.[5] Such involutionary changes in the heart would best explain the greater vulnerability of the older patient as a result of acute myocardial infarction. This concept offers the most logical explanation for the greater frequency of serious attacks and the higher mortality observed statistically in old-age groups. Regardless of the explanation, however, our findings appear to show that once the attack has struck the immediate outcome can only be estimated from the clinical signs and symptoms in the individual case. Our grouping of patients according to the severity of the clinical picture during the first 24 hours of hospitalization has not demonstrated that the factor of age exerts a bearing on immediate survival. Although severe attacks are commoner in older subjects, the prognosis of a severe or mild attack appears to be unaltered by age. It must, therefore, be concluded that the statistical correlation of age with group survival is not accompanied by a similar age influence on survival in the individual case.

In a previous publication [6] we pointed out that no justification exists for the routine employment of bishydroxycoumarin (dicumarol®) in cases of acute myocardial infarction and that this form of therapy should be reserved for "poor risk" cases exclusively. It is our contention that only in the severer attacks does the benefit from bishydroxycoumarin therapy outweigh its harmful effects. Others [7] have noted that use of anticoagulants significantly reduces the mortality rate from acute myocardial infarction in old age groups, a result not observed among younger patients. The explanation for this finding obviously rests on the higher incidence of serious attacks among older subjects. However, since we have shown that age itself is not a significant factor in the immediate outcome of acute myocardial infarction in the individual case, age should not be considered an important element indicating or contraindicating the use of anticoagulants. It is therefore concluded that the history and the clinical signs and symptoms in any given case—and not the age of the patient—provide the data necessary for prognostication and for decision with regard to the use of anticoagulant drugs.

SUMMARY AND CONCLUSIONS

Crude statistics have shown that the death rate from acute myocardial infarction is considerably higher among patients over 60 than among those below this age. From these findings it has been generally accepted that the patient over 60 has a greater chance of dying from acute myocardial infarction than the younger patient who has sustained an attack of equal severity. The possible fallacy in such reasoning suggested a study in which the elderly patient's relative capacity for survival could be estimated from a comparison of clinical attacks of similar nature and severity.

An analysis of mortality in 1,047 cases of acute myocardial infarction is reported. From the data obtained the following conclusions have been drawn:

1. The higher mortality rate from acute myocardial infarction observed in older age groups is due to a greater frequency of serious attacks, probably as a result of senile deterioration of the myocardium.

2. Nevertheless, the outlook for a severe or mild attack is no worse in the elderly patient than in the younger one. The prognosis in an individual case clearly does not depend on age but on clinical signs and symptoms.

3. The statistical correlation of age with group prognosis, therefore, should not prejudice the clinician in his prediction of the probable outcome in any specific case.

4. Similarly, the age of the patient should not be considered an important factor indicating or contraindicating the use of anticoagulants in acute myocardial infarction.

5. The pessimism commonly revealed in the estimation of prognosis in any elderly patient with this disease is unwarranted if based on age alone. Too often the persistence of such pessimism, even after satisfactory recovery, has condemned the elderly "good risk" survivor to a nonproductive, boring existence. Patients in this category as well as those in younger groups may be successfully rehabilitated toward regaining a measure of personal, social, and economic independence consistent with their residual capacity.

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Artefacts on Chest X-Ray Films.—A type of opaque, white artefact which occurs on the chest roentgenogram is often mistaken for a pulmonary infiltration. Although it may at times resemble an area of primary atypical pneumonia, or a fresh unorganized pulmonary infarct, this artefact is most likely to be confused with the early minimal lesion of pulmonary tuberculosis. . . . The so-called "pressure mark" . . . is dependent upon a local change in the sensitivity of the film emulsion with consequent alteration in its response to roentgen-ray exposure. These changes . . . are brought about by mechanical stretching, bending or compression. The opaque, white "pressure mark" results from the latter influences only when applied to the film before its roentgenographic exposure. . . .

Although "pressure marks" may be strongly suspected when the shadow in question shows a higher degree of whiteness than any other portion of the chest roentgenogram, and when this whiteness diminishes imperceptibly towards its periphery, an acute exudative tuberculous lesion of a confluent lobular nature has at times been noted to present a very similar appearance. . . . The observer's index of suspicion should be heightened . . . when any of the following conditions are noted: (1) the presence of associated artefacts more readily identified; . . . (2) the presence of a generalized increase in film sensitivity as evidenced by a roentgenogram which appears darker than it should after normal exposure and development, or appears of uneven density. The shadow which appears crescent-shaped will be easily recognized as a typical "pressure mark," especially if accompanied by a sharp black "crinkle" line, or by a linear white mark bisecting its concavity. The observer's suspicions are confirmed when immediate roentgenographic re-examination fails to disclose the shadow previously noted.—Irving J. Kane, M.D., Artefacts Simulating Minimal Pulmonary Tuberculosis, *The American Journal of Roentgenology and Radium Therapy*, November, 1951.

ORAL CORTISONE THERAPY IN INTRACTABLE BRONCHIAL ASTHMA

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Specific treatment of bronchial asthma, such as avoidance of offending allergenic agents and specific hyposensitization, so far are the best methods to pursue in order to obtain complete relief of symptoms. However, when a patient is observed during an acute asthmatic attack, satisfactory symptomatic relief is desired as quickly as possible. The type of treatment instituted will depend on the severity, frequency, and duration of the asthmatic attack. In acute asthma, and even in chronic asthma, the acute exacerbations can be relieved without difficulty with epinephrine or aminophylline, and in mild attacks with oral or aerosol bronchodilators. The administration of cortisone is not the first line of approach in the treatment of acute asthma.

In a small number of patients the asthmatic paroxysm increases in severity, the usual therapeutic measures fail, the patient becomes epinephrine-fast and remains in a severe, constant asthmatic state, designated as status asthmaticus. In these patients the usual therapeutic measures, such as the use of fluids, oxygen, intravenous aminophylline, and 5% dextrose, antibiotics, iodides, and barbiturates, should be employed first.

In patients with status asthmaticus who have failed to respond to the usual therapeutic measures, Randolph and Rollins,[1] Carryer and associates,[2] Segal and Herschfus,[3] Rose,[4] and others [5] have reported striking benefit resulting from the use of corticotropin (ACTH) or intramuscularly administered cortisone. They produced marked symptomatic relief in most cases. It should be emphasized that once corticotropin or cortisone therapy is instituted, the usual therapeutic measures should not be discontinued immediately. Repeated injections of epinephrine or aminophylline may still produce some immediate but temporary relief until corticotropin or cortisone takes effect. These hormones do not work rapidly enough to relieve the asthmatic symptoms immediately or save the patient's life in an acute allergic emergency. From the experience of several investigators, the symptoms are relieved within 24 to 96 hours after corticotropin or cortisone therapy is started. With the onset of symptomatic relief the usual therapeutic measures can be gradually eliminated. Relief with cortisone or corticotropin is temporary, and symptoms tend to recur. During the period of remission, an attempt should be made to determine and avoid the etiological factor or factors and specific hyposensitization should be instituted.

Sometimes, the acute asthmatic attacks are so frequent, the patient has no interval free from symptoms.

TABLE 1.—*Clinical Course of Patients Prior to Oral Cortisone Therapy*

Patient	Age (Yr.)	Sex	Duration of Asthma (Yr.)	Severity of Attacks
1. F. N.	16	F	8	Very severe; daily for 3 mo.
2. C. W.	32	M	1½	Moderately severe; daily 2 mo.; emphysema
3. C. M.	35	F	11	Moderately severe; daily 6 mo.; emphysema
4. I. I.	33	F	8	Very severe; daily 1 mo.
5. B. K.	51	M	17	Moderately severe; daily 6 mo.; emphysema
6. B. P.	5	F	3½	Very severe; daily 2 weeks
7. H. A.	42	M	35	Very severe; daily 1 mo.; 87 injections of epinephrine in 17 days
8. A. M.	55	M	26	Moderately severe; daily for 5 yr.; emphysema
9. E. M.	49	F	32	Moderately severe; daily 3 mo.
10. S. G.	25	M	9	Moderately severe; daily 2 weeks
11. R. R.	47	F	3	Moderately severe; daily 2½ mo.
12. A. B.	38	F	2½	Very severe; daily for 2 weeks
13. R. S.	18	F	3	Moderately severe; daily 2 weeks; pulmonary vascular allergy
14. M. A.	37	F	3	Moderately severe; daily 6 weeks
15. G. L.	30	M	27	Moderately severe; daily 4 weeks
16. G. Y.	10	M	4 mo.	Very severe; continuous 4 days
17. E. Z.	6	M	4	Moderately severe; daily 3 weeks
18. H. T.	67	M	9	Very severe; continuous symptoms 8 yr.; bronchiectasis; emphysema
19. A. C.	8	M	2	Moderately severe; daily 2 weeks
20. A. L.	66	F	20	Moderately severe; daily 1 yr.
21. H. C.	23	F	1½	Moderately severe; daily 1 mo.
22. H. D.	42	F	6	Very severe; 24 hr. duration

Even between the acute attacks, the patient has some dyspnea and wheezing. These symptoms may persist for days, months, or even years. The patients in this group are designated as having chronic intractable bronchial asthma.

SCOPE OF STUDY

A study has been undertaken to determine whether orally administered cortisone will influence the symptoms of chronic intractable bronchial asthma (Table 1). A total of 22 patients receiving 31 courses were treated with orally administered cortisone tablets. The ages of the patients ranged from 5 to 67 years. There were 12 females and 10 males. The duration of asthma varied from four months to 35 years. Prior to the onset of oral cortisone therapy, these patients had moderately severe, or very severe, incapacitating asthmatic attacks ranging in duration from four days to six years, and were resistant to all other forms of therapy. Oxygen inhalation and repeated injections of intramuscular epinephrine and intravenous aminophylline were required several times

Cortisone acetate tablets were furnished through the courtesy of Merck & Company, Inc., Rahway, N. J.

Read before the Section on Internal Medicine at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 14, 1951.

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during the day and at night in most cases, and produced slight and temporary relief. Hyposensitization in 15 of the 22 patients had not afforded significant relief.

An attempt was made to minimize the occurrence of possible side effects. All patients were given a low-sodium diet and 15 drops of saturated solution of potassium iodide three times daily. The group consisted of clinic and office patients. They were observed daily and contacted as often as it was necessary. The patients' weight, fluid intake and output, blood pressure, and the results of the urine examination for sugar were charted daily. In the beginning, extensive laboratory tests were made. However, later on it was found that short-term therapy could be carried out safely for up to two weeks without extensive tests if there were proper cooperation between patient and physician and careful observation as to the possible occurrence of side effects. With long-term therapy, extensive laboratory tests were again made once or twice weekly. Patients with hypertension, diabetes mellitus, congestive heart failure, coronary artery disease, peptic ulcer, and psychopathic personalities were not included in this study.

DOSAGE SCHEDULE

The initial daily dose of cortisone ranged from 200 mg. to 300 mg. for adults. The daily dose for the second day ranged from 100 mg. to 200 mg. and was followed by 100 mg. daily until adequate relief was obtained. When relief occurred, the dose was reduced to the minimum amount necessary to maintain adequate relief. The total daily dose was given orally in four equal doses at four-hour intervals. The dose for children was 25% to 75% of the adult dose. In adults the average maintenance dose was 25 mg. twice daily, although an attempt was made to adjust the dose to the clinical response of the patient. The duration of therapy ranged from 1 to 45 days.

RESULTS OF TREATMENT

Orally administered cortisone definitely relieved the symptoms of chronic intractable asthma in 26 of 31 courses given to 22 patients. Five courses in five different patients had no benefit, and four of these five patients had emphysema. In those patients who obtained relief it was much greater than that previously obtained with any other medicament. Eighteen patients obtained relief in 5 to 12 hours, six in 24 hours, one in 48 hours, and one in 72 hours. Relief was maintained as long as adequate therapy was continued. Discontinuation of cortisone therapy, or too great a reduction in the daily dose, resulted in a partial or complete recurrence of the pretreatment pattern of the asthmatic attacks. The symptoms of 18 patients (61%) relapsed within two weeks after cortisone therapy was stopped; in 8 patients they relapsed within the first week and in 10 during the second week. The shortest period of remission was 12 hours; the longest, 210 days. There was no relationship between the total dosage, or duration of adequate therapy, or both, and the length of the remissions in these patients (Table 2).

TABLE 2.—*Results of Oral Cortisone Therapy*

Patient	Duration of Treatment: Course	Duration of Treatment: Days	Results	Length of Remission	Remarks
1. F. N.	1	12	Excellent	2 weeks	Returned to school on 4th day of cortisone therapy; best winter in 5 yr.
	2	2	Excellent	10 days	
	3	2	Excellent	10 days	
2. C. W.	1	14	Excellent	10 days	Status asthmaticus developed during 4th course; hospitalization; usual therapeutic measures failed; intramuscular ACTH therapy produced relief
	2	7	Excellent	3 days	
	3	1½	Excellent	14 days	
	4	2	None	.....	
3. C. M.	1	45	Good	2 days	On 2d day of cortisone therapy, resumed household duties—1st time in six months
4. I. I.	1	24	Good	2 days	On 4th day of therapy did entire family wash; on 7th day danced all evening; on 22d day angioneurotic edema of face and generalized urticaria developed (1st time in 3 yr.)
5. B. K.	1	35	None	None	Decrease in dyspnea and cough; examination of chest always wheezing, though symptomatically improved
6. B. P.	1	4	Excellent	210+ days	Marked improvement 2 hr. after 1st dose of 12.5 mg. cortisone
7. H. A.	1	17	Excellent	1 day	On 2d day of therapy did heavy work putting up storm windows and gardening
	2	14	Excellent	7 days	
8. A. M.	1	18	Fair	3 days	On 4th day of therapy was able to work 1st time in 10 mo.
	2	5	None	.....	
9. E. M.	1	29	Excellent	180+ days	Best relief in 32 yr.
10. S. G.	1	4	Excellent	92 days	Relief in 24 hr.; 4 days treatment
11. R. R.	1	7	Good	42 days	Symptomatic relief; examination of chest wheezing at all times
12. A. B.	1	7	Excellent	1 day	Relief after 2d tablet of cortisone
13. R. S.	1	7	Excellent	64 days	Transitory pulmonary infiltration with blood eosinophilia of 18 mo. duration arrested with intramuscular cortisone; remission of pulmonary infiltrations 16 (+) mo.
14. M. A.	1	5	Good	18 days	Even with complete relief of symptoms, examination of chest showed slight wheezing
	2	2	Good	9 days	
15. G. L.	1	4	Excellent	150+ days	Mediastinal and subcutaneous emphysema during asthmatic attack Nov., 1944
16. G. Y.	1	2	Excellent	12 days	Relief in 12 hr.; previously no relief with epinephrine, aminophylline, oxygen, penicillin
17. E. Z.	1	12	Good	11 days	Allergic rhinitis also improved, while taking cortisone
18. H. T.	1	2	None	.....	Patient died after 2 days of cortisone therapy; total dosage 400 mg.; autopsy findings: complete fibrosis, myocardium left ventricle, severe generalized arteriosclerosis, emphysema, bronchiectasis, hypertrophy right heart; adrenals, normal size and shape, no depletion of lipids
19. A. C.	1	6	Excellent	6 mo.	Complete relief in 24 hr.; remission 6 mo. in duration
20. A. L.	1	1	None	.....	Cortisone therapy discontinued because of edema of hands and feet
21. H. C.	1	25	Fair	12 hrs.	Return of pretreatment pattern of asthmatic attacks after 2 courses of cortisone therapy
	2	12	Excellent	9 days	
22. H. D.	1	7	Excellent	14 days	13 previous hospital admissions because of status asthmaticus; oral cortisone might have prevented another; remission after cortisone, 14 days; then sudden severe status asthmaticus requiring hospitalization developed; relief in 36 hr. with ACTH and usual therapeutic measures

Five patients had more than one course of therapy:

1. F. N. had three courses with excellent results, with remissions of 14 days, 10 days, and 10 days. Thereafter her symptoms were easily controlled with oral or aerosol bronchodilators.

2. C. W. had excellent results with the first three courses and none with the fourth.

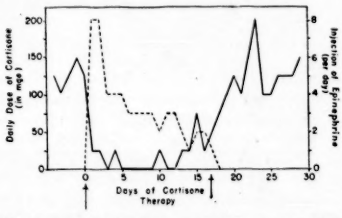
3. H. A. had marked relief with two courses but his remissions lasted only one and seven days.

4. M. A. was given two courses with good results each time and remissions of 18 and 19 days.

5. H. C. after 25 days of therapy had fair relief with a remission of 12 hours, and with the second course of 12 days' treatment had excellent results with a remission of nine days.

The following paragraphs describe in greater detail certain aspects of several cases in which oral cortisone therapy was used. The case numbers refer to those in Tables 1 and 2.

CASE 7.—H. A. had received 17 days of cortisone therapy during the first course of treatment, with excellent relief. Prior to the onset of cortisone therapy he had been using between four and six injections of epinephrine daily (Chart), and the total for a similar pretreatment period of 17 days was 87 injections. During the first 12 days of treatment he required only one injection on each of the 1st, 2nd, 4th, and 10th days. On the others he used none. From the 13th to the 17th and final day of treatment, when the dosage was either 25 mg. or 50 mg., he used a total of eight injections. After discontinuing cortisone he had a remission of one day, and thereafter he needed between three and eight injections a day, a total of 85 injections, for a similar 17-day period. He had excellent results with a second course of 14 days' therapy with a remission of 7 days' duration. From then on, with the simultaneous administration of 50 mg. of cortisone every third day and oral bronchodilators for 26 days, he was able to decrease his epinephrine injections to one, and occasionally two, injections a day. Previously, oral bronchodilators did not afford relief.



Relationship between epinephrine requirements and cortisone therapy.

CASE 18.—H. T., a 67-year-old man, died from an acute asthmatic attack after two days of cortisone therapy. The total dosage was 400 mg. The patient experienced marked relief in 36 hours, and then the clinical picture changed rapidly and the patient died suddenly during an acute asthmatic attack. The autopsy findings (made by Dr. Joseph Bellamy) were as follows:

Severe generalized arteriosclerosis. Severe coronary arteriosclerosis with calcification and marked narrowing of all branches. The myocardium of the left ventricle showed large areas of complete fibrosis, particularly in the septum. The heart was not enlarged, and there was slight left ventricular hypertrophy. The lungs showed emphysema, bronchiectasis, and fibrosis, particularly of the apical regions. The right side of the heart showed moderate hypertrophy. The liver and spleen showed changes of congestive heart failure. The kidneys showed severe arteriosclerotic scarring. The adrenal glands were normal in size and shape. The adrenal cortex was yellow and there was no depletion of lipids. Incidental findings not related to the cause of death were nodular goiter and benign prostatic hypertrophy. It was the opinion of the pathologist that the main cause of death was the severe damage to the heart, which, with the added burden of the lung disease, was unable to cope with the strain.

CASE 13.—R. S., a 17-year-old female student, was treated successfully in February, 1950, with intramuscularly administered cortisone because of transitory pulmonary infiltrations with blood eosinophilia of 18 months' duration. She had an unusual, stormy, and protracted clinical course, and her response to cortisone was remarkable and dramatic. It produced a disappearance of fever, tachycardia, leukocytosis, pulmonary infiltrations, anemia, purpura, arthralgia, polyneuritis, and subcutaneous nodules. Cortisone had no effect on a preexisting right bundle branch block and cardiac hypertrophy. Cortisone interrupted the downhill course of the disease. To date her response to effort is normal and the length of remission of the pulmonary infiltrations is 16 months. However, she continued to have mild asthmatic attacks, and on one occasion a moderately severe intractable asthma of two weeks' duration developed which failed to respond to the usual therapeutic measures. She had excellent relief 12 hours after the onset of oral cortisone therapy. The duration of treatment was seven days, followed by a remission of 64 days.

There seemed to be an increase in the sense of well-being with most of the patients, and in several a sense of euphoria developed. Several of the patients showed a marked increase in physical activity while taking cortisone. The increased physical activity was mainly due to symptomatic relief. In some, however, the sense of well-being, or euphoria, was present even though examination of the chest at the time revealed wheezes and sibilant and sonorous rales. As a rule the appetite was increased. In one patient ankle edema developed after she had received cortisone for 24 hours; this cleared up when the medication was stopped. There was an initial decrease in urinary output in four patients, and an initial gain in weight in six. There was no change in the blood pressure in any of the patients. Occasionally an instance of glycosuria appeared. With the decrease of the dose these side effects disappeared. No incidence of hemorrhagic tendency, appearance of ulcer, or masked infection such as pneumonia or septicemia has been encountered in this series of patients. There were no other side effects, and there were no significant changes in serum sodium, potassium, or blood chloride levels.

SUMMARY AND CONCLUSION

Orally administered cortisone relieved the symptoms of intractable bronchial asthma in 26 of 31 courses of treatment given to 22 patients. Five courses in five different patients had no beneficial effects, and four of the five patients had emphysema. Relief was much greater than that obtained previously with any other medication. Relief with orally administered cortisone occurred within 5 to 72 hours after the onset of therapy, and on adequate dosage was maintained during cortisone administration. The symptoms of 18 patients (61%) relapsed within two weeks after cortisone was discontinued. In this series of patients there was no relationship between the total dosage or duration of therapy, or both, and the length of remissions. Ankle edema occurring in one patient, an initial decrease in urinary output in four, an initial gain in weight in six, and an occasional occurrence of glycosuria disappeared on decreased dosage of cortisone. One patient died from an acute asthmatic attack, and the autopsy findings showed no evidence of relationship between cortisone therapy and the cause of death. Once an optimum dose of cortisone has produced complete

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relief, the simultaneous administration of suboptimal doses of cortisone and such types of drugs as bronchodilators, iodides, antibiotics, and other well-tried general measures of treatment suggest the possibility that a remission can be maintained much longer. A low sodium intake should be continued after the course is terminated in order to stimulate the patient's own adrenal cortex and reduce the early relapses. The results justify the use of orally administered cortisone for symptomatic relief in intractable bronchial asthma after the usual therapeutic measures have failed. Cortisone therapy is not a substitute for allergic management. Only by the elimination of the offending factor, or factors, and hyposensitization where elimination cannot be carried out, can one obtain complete success.

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TERRAMYCIN IN EPIDEMIC TYPHUS, AMEBIC DYSENTERY, AND TYPHOID

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Terramycin, introduced one year ago, has been tried and found successful in the treatment of an extensive array of human diseases. Its usefulness in epidemic typhus, acute amebic dysentery, and typhoid, however, has not yet been established. This report presents the results of treatment in five patients with epidemic typhus, seven patients with acute amebic dysentery, and five patients with typhoid. The findings suggest that in epidemic typhus terramycin is curative and that in acute amebic dysentery it is efficacious but has definite limitations. In typhoid, contrary to reports of failure to date, terramycin may elicit a favorable response in some patients.

Snyder and his colleagues [1] in experiments with chick embryos found that terramycin suppressed the multiplication of Rickettsia prowazeki, but in studies on infected cotton rats the same authors were unable to obtain survival. Reports of trials in epidemic typhus in humans have not yet come to our attention, but clinical studies have demonstrated the effectiveness of terramycin in other rickettsial diseases. Schoenbach and his co-workers [2] and Bauer and his co-workers [3] have reported the use of terramycin in four cases of Rocky Mountain spotted fever. All the patients responded rapidly, becoming afebrile in 36 to 72 hours. Similar favorable action of terramycin in other rickettsial diseases has been observed by Rose [4] in four cases of rickettsialpox, by Smadel and collaborators [5] in four cases of tsutsugamushi disease, and by Bauer and his colleagues [3] in one case of murine typhus.

Most and Van Assendelft [6] reported on a 10-day treatment with terramycin in 22 patients with amebiasis. One patient, whose stools had become negative for amebae, again had positive stool cultures on the 11th day after the termination of therapy; the stools of the other 21 patients remained negative. However, the duration of follow-up was short. Eight of 11 patients had been followed less than three weeks, and the exact interval of study on the others is not clear. The average number of stools examined per patient subsequent to therapy was 3.3. No cases of acute amebic dysentery were reported in the series.

Reported experience with terramycin in typhoid is meager. Bauer and his co-workers [8] described one patient who did not respond to a five-day course of treatment which began on the 20th day of illness. Reference is made in the same paper to unpublished studies by Knight [7] which "indicated that terramycin has little effect in clinical typhoid fever." Attempts by Bauer [8] to eradicate the infection in two biliary tract carriers also failed. Treatment with terramycin of other Salmonella infections has been more encouraging. Satisfactory response has been noted in four cases of gastroenteritis, three due to Salmonella newington and one to Salmonella oranienburg.[8]

EPIDEMIC TYPHUS

The five patients in this series came to our attention near the end of the first week of illness, when the cutaneous rash appeared; thus the duration of illness at the beginning of treatment ranged from six to eight days. The severity of the illness on admission varied considerably even in this small series. One patient, although his temperature was high and the rash moderately heavy, ap-

The terramycin was supplied by Charles Pfizer and Co., Inc., Brooklyn.

From the Department of Clinical Investigations, U. S. Naval Medical Research Unit No. 3, Cairo.

Complement-fixations and rickettsial agglutinations were performed at the Army Medical School, Washington, D. C., and the National Institutes of Health, Bethesda, Maryland.

These studies were made possible by the cooperation of the Egyptian Ministry of Health; Dr. Aly Bey Abdel Wahib, Director of the Abbassia Fever Hospital; and Dr. Hassan Fahmy Khalil Bey, Director of the Imbaba Fever Hospital, Cairo.

This article has been released for publication by the Research Division of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth are those of the writers and are not to be construed as reflecting the policies of the Department of the Navy.

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peared to be only slightly ill. Three patients were severely ill, and the fifth patient was considered to be fatally ill.

Four tests were utilized to establish the diagnosis of typhus: (1) Weil-Felix (OX19) agglutination with rising titer; (2) complement fixation; (3) rickettsial agglutination; and (4) isolation of rickettsiae from the patient's blood by guinea pig and mouse inoculation. Four of the cases fulfill three of the criteria for a diagnosis of typhus; one case fulfilled two of the criteria. Rickettsial agglutinations in the latter case were positive for murine typhus in higher dilutions than for epidemic typhus, but clinically this case could not be differentiated from one of epidemic typhus.

The dosage of terramycin was 75 mg. per kilogram of body weight per day. The drug was administered on a four-hour schedule with a preliminary loading dose of 25 mg. per kilogram of body weight. Terramycin blood levels were checked in all patients and varied from 2.6 to 11.1 γ per milliliter. Therapy was continued until the patient had been afebrile for 48 hours.

In this series the response was uniformly rapid. The stupor present on admission in the first four patients

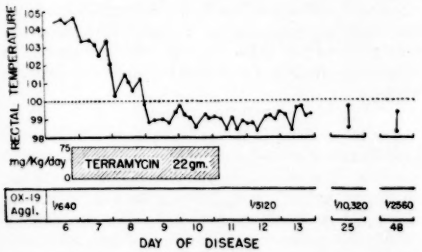

Fig. 1.—Temperature response of patient with typhus to terramycin within 56 hours. Uncomplicated convalescence.

cleared within 24 hours. The fifth patient was maniacal on admission and unable to articulate clearly. He continued in an acute psychotic state for nine days, i. e., until two days after cessation of therapy, at which time his mental state began to show improvement; his subsequent convalescence was uneventful.

Rectal temperatures on admission ranged from 103 to 106 F, but, as did the other signs and symptoms, the fever rapidly subsided on treatment. The temperatures of four of the patients became normal within three days, but the most severely ill patient required five days to attain a normal temperature. There were no complications during convalescence. A typical clinical course as observed in four of the five cases is illustrated by the following case report.

REPORT OF CASE

An Egyptian man, aged 34, was well until six days prior to admission, when he had a shaking chill and a severe frontal headache and fever developed. On the second day of his illness he went to bed because of pain in his thighs, calves, and knee joints. On the third day he had ringing in his ears and a cough productive of small quantities of clear sputum. He was seen by a physician, who advised hospitalization. On admission (Fig. 1) the temperature was 104.4 F and the patient was mentally confused. Examination showed a macular rash on the trunk, most marked on the back but also involving the arms and legs. There was no rash on the palms or soles. Most of the lesions blanched on pressure, but some were fixed. Two hemorrhagic areas were present in the conjunctiva of the left eye. Both lungs were resonant to percussion, but there were scattered rhonchi and crepitant and musical rales to auscultation. The liver was just palpable at the right costal margin, and the spleen was palpable 3 cm. below the left costal margin; neither was tender.

The total white blood cell count was 7,500, with 73% neutrophils. Blood drawn on admission agglutinated Proteus OX19 in the dilution of 1:640. A portion of this specimen inoculated into guinea pigs subsequently led to the isolation of a Rickettsia.

Terramycin was begun on the seventh day of illness. Within 24 hours the patient was alert and his headache had decreased in intensity, although the temperature remained elevated. No new rash was identified. At the end of 52 hours of treatment, the patient had become afebrile and the only complaint was of slight dizziness. Terramycin was discontinued after 48 hours without fever, the patient having received a total of 22 gm. He was allowed to become ambulatory on the fifth day of hospitalization; subsequent convalescence was uneventful.

AMEBIC DYSENTERY

To date seven patients with amebic dysentery have been treated with terramycin. Three of the patients had experienced prior attacks of bloody diarrhea, and two of these three had been treated with aureomycin for amebiasis three months previously.

On admission to the hospital all of the patients complained of generalized abdominal cramps and bloody diarrhea with mucus. In addition six complained of pain in the right upper abdominal quadrant. All seven exhibited tenderness over the hepatic area, and in six the liver was enlarged to below the costal margin. All had tenderness over both the ileocecal and the rectosigmoid areas.

Repeated stool examinations revealed numerous motile trophozoites of Endamoeba histolytica. Stool cultures were positive for E. histolytica and negative for bacterial pathogens in every case. Proctoscopic examinations revealed various degrees of mucosal ulceration, inflammation, and edema. Specimens taken from these ulcerations again showed numerous active trophozoites of E. histolytica, many with ingested red blood cells.

The loading dose of terramycin consisted of 50 mg. per kilogram of body weight given in the first hour. The dose administered for the first three days was 150 mg. per kilogram per day, after which it was reduced to 75 mg. per kilogram per day for the balance of the total treatment period of 14 days. Three of the seven patients complained of anorexia and nausea while on the initial higher dose. These side-effects promptly disappeared after the planned reduction in dosage.

In general the response to treatment was good. Stools and proctoscopic specimens became negative for amebae in four patients within two days, while the other three, more severely ill, required four to eight days to produce negative stools and specimens. Abdominal cramps and bloody diarrhea disappeared within two to six days, and the time required for disappearance of these symptoms was generally proportional to the degree of the lesions observed at proctoscopy. Pain in the right upper abdominal quadrant and hepatic tenderness required a longer period to disappear, and in one patient hepatic abscess developed during terramycin therapy.

Two of the seven patients have only recently completed treatment and cannot be discussed in terms of follow-up. Of the five patients with a follow-up of three

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months or more, only two have remained asymptomatic and clinically free of E. histolytica after one course of terramycin. These two patients have had 57 and 18 stools examined and found negative during follow-up periods of 19 and 14 weeks, respectively. In the other two patients, E. histolytica recurred in the stools. In one of these the parasite was observed again only eight days after the cessation of therapy while the patient was still in the hospital. Symptoms of dysentery recurred in this patient; he was retreated with terramycin with a satisfactory response. In the other patient, E. histolytica reappeared in the stool within a month after he had been discharged. The former case seems almost surely a relapse; the latter may possibly represent a reinfection. The fifth patient, although his stools had become negative for amebae and his dysentery had responded well, is the one in whom a hepatic abscess developed during terramycin therapy. The report of this case follows.

REPORT OF CASE

An Egyptian man, aged 35, was well until 16 days before admission, when generalized abdominal cramps developed, associated with bloody diarrhea seven to ten times daily, low grade fever, and marked anorexia. His symptoms gradually increased in severity, and he passed as many as 21 bloody liquid stools per day. Other than three tablets of an iodochlorhydroxyquin preparation (entero-vioform®) daily for two or three days just prior to admission, the patient had received no specific medication. He denied previous similar episodes of diarrhea.

Physical examination on admission revealed an acutely ill, emaciated man with obvious abdominal discomfort and with marked tenderness in the right upper and lower quadrants of the abdomen. Rectal temperature was 100 F. Abdominal splinting prevented palpation of the liver edge, but percussion indicated that this organ was enlarged to about 4 cm. below the costal margin. The stools consisted largely of blood and mucus and contained many trophozoites of E. histolytica, some with ingested red blood cells. Proctoscopy revealed numerous ulcer craters up to 1.5 cm. in diameter and marked mucosal edema. Protoscopic specimens taken from the ulcers contained many E. histolytica trophozoites and were negative for enteric pathogens by bacterial cultures. The white blood cell count was 17,600, with 91% neutrophils. Liver function studies revealed a sulfobromophthalein retention of 9% at 45 minutes, serum bilirubin of 1 mg. per 100 cc., and normal thymol and zinc turbidities.

The patient was given the experimental routine dosage of terramycin on his fifth hospital day (Fig. 2). His condition began to improve within 36 hours after the institution of therapy. Stools gradually became less frequent and no longer contained gross blood. Hepatic and abdominal pain and tenderness decreased in severity, and the patient's appetite improved. However, on the fourth day of treatment the patient began to complain of increasing pain in the hepatic area; on the sixth day of terramycin therapy his temperature rose to 103 F. Although stools were normal in color, semi-formed, and negative for amebae by the ninth day, the patient continued to be febrile and complained of increasing pain. On the 11th day a mass was visible in the right upper quadrant of the abdomen. Three days later, after 14 days of treatment, terramycin was discontinued, the total dose having been 66 gm. At this time the liver edge was palpable 18 cm. below the right costal margin in the midclavicular line. The hepatic mass, first noted on the 11th day, now measured 10 cm. in diameter and was markedly tender and fluctuant. After the completion of terramycin therapy, the patient was given chloroquine, 1 gm. daily for two days and then 0.5 gm. daily for 12 additional days. Response was dramatic, with defervescence of fever in 36 hours. The patient appeared less toxic, his appetite returned, and liver pain and tenderness decreased in severity. On the 10th day of chloroquine therapy, 245 cc. of tenacious pea-green exudate was aspirated from the mass, with further diminution of pain and tenderness in the right upper abdominal quadrant. Examinations and cultures of the exudate for both E. histolytica and bacteria were negative. After the completion of chloroquine therapy, the patient continued to improve. He was observed on the ward for another eight weeks, during which time he gained 42 lb. (19 kg.) in weight. The liver edge gradually receded to a point 3 cm. below the costal margin. During this period of observation, 35 stools, of which five were purged specimens, were examined in saline smears, by stained smears, and by culture. All were negative for E. histolytica. Proctoscopy one week before discharge revealed one small superficial ulcer in the rectum; otherwise the findings were negative. At last examination, six weeks following discharge, the patient had remained asymptomatic and three additional stool examinations had been negative for E. histolytica.

TYPHOID

Five patients with typhoid have been treated with terramycin. All were acutely ill and febrile. The duration of illness before treatment ranged from 6 to 11 days, with an average of 9 days. In all five cases Salmonella typhosa was isolated from the blood, and in three the organism was also isolated from the feces. Admission Widal tests resulted in titers varying from 1:10 for O antigen and negative for H antigen, to 1:1,280 for O and 1:1,280 for H.

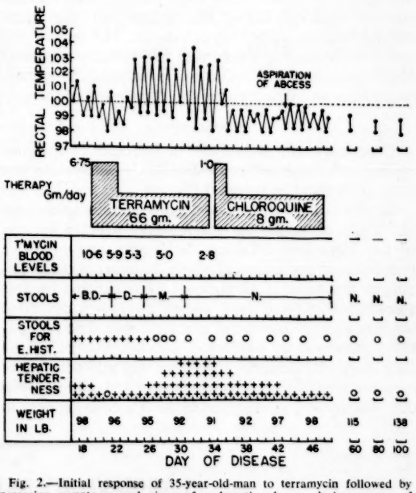

Fig. 2.—Initial response of 35-year-old-man to terramycin followed by increasing symptoms and signs of a hepatic abscess during course of amebic dysentery. Subsequent chloroquine therapy and aspiration resulted in resolution of the abscess. B.D., D., M., and N. refer to bloody diarrheic, diarrheic, mushy, and normal stools, respectively.

The first three patients were started on terramycin at 75 mg. per kilogram of body weight per day. In one of these the dose was later increased to 125 mg. per kilogram per day. The dose in the remaining two patients was 100 mg. per kilogram per day.

Clinical response following the institution of terramycin therapy was variable. Only three of the five patients appeared to respond to the drug, becoming afebrile in an average of four and one-half days after the institution of therapy. These three patients received an average total dosage of 43 gm. over an average period of 11½ days. Another patient did not become afebrile until after 15½ days of terramycin therapy (26th day of illness).

In this patient the prolonged period of fever following the institution of therapy probably represented a course of the disease uninfluenced by therapy. The remaining patient was initially treated with 75 mg. per kilogram of body weight per day. Because the organism isolated from his blood required 3.12 γ of terramycin for inhibition of growth for 48 hours and the blood levels attained with the initial dosage were from 3.7 to 5.2 γ, the dosage was increased to 125 mg. per kilogram per day. After this increase in dosage, the blood levels ranged from 5.7 to 7.7 γ. However, this patient continued to be febrile and had an intestinal hemorrhage on the third day. After remaining highly febrile for 22 days on terramycin therapy (98 gm. of the drug), the patient was given chloramphenicol, with satisfactory response within 36 hours.

All four of the patients treated with terramycin alone were followed for three to five weeks after the completion of therapy. In none of these were positive urine or stool cultures observed during this period, nor were there clinical findings suggestive of relapse. The patient that failed to respond to terramycin and therefore received chloramphenicol was found to be excreting S. typhosa in his feces two months after the completion of therapy.

SUMMARY

Experience with terramycin in five cases of epidemic typhus, seven cases of acute amebic dysentery, and five cases of typhoid is reported.

In typhus the response to treatment with an average of 22 gm. of terramycin administered over an average of five days was excellent. Subjective and objective improvement was observed within 24 hours of the beginning of treatment in all patients. Four patients became afebrile within three days, and by the fourth day these patients were in uneventful convalescence. The fifth patient, moribund on admission, became afebrile by the sixth day; convalescence thereafter was uneventful save for some mental confusion which persisted until the 10th day. The results, as observed in the five cases, appear to compare favorably with reports in which chloramphenicol or aureomycin has been used.

In amebic dysentery an average of 66 gm. of terramycin was administered over a 14-day period. In all patients there was disappearance of bloody diarrhea, tenesmus, and other dysenteric symptoms within two to six days (average four days). Stools and proctoscopic specimens became negative for amebae after two days in four patients and after four to eight days in the remaining patients.

Unlike the dysenteric symptoms, hepatitis, concomitant in all patients, disappeared slowly. In one patient a hepatic abscess developed during terramycin therapy. The administration of chloroquine resulted in recession and final cure of the abscess. The result in this case and the relatively poor response of hepatitis to terramycin alone in the other cases suggest that the combined use of chloroquine and terramycin may prove more efficacious to combat both the hepatic and the dysenteric phases of the disease.

Five of the patients treated for dysentery have been followed for three to five months, with 20 or more stool examinations in each case. In two there has been a reappearance of the parasite, and in one of these two dysenteric symptoms have recurred.

The dosage of terramycin in the five cases of typhoid ranged from 43 gm. in 12 days to 98 gm. in 22 days. Three of the patients became afebrile in an average period of four and one-half days, but there was no evidence of response in the other two. There were no relapses in this series.

CONCLUSIONS

The therapeutic results in this small series suggest that terramycin is curative in epidemic typhus, will prove useful with limitations in acute amebic dysentery, and, contrary to previous reports, may be effective in some cases of typhoid.

Navy Medical Research Unit.

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LABORATORY-ACQUIRED INFECTIONS

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Although numerous individual case reports of laboratory-acquired infections have appeared in the literature, few studies have given any indication of the magnitude of this problem as it relates to the occupational health of laboratory workers. As a matter of fact, until recently little consideration at all has been given to the need for adequate protection of personnel who come in daily contact with disease-producing agents. By means of a questionnaire circularized to 98 laboratories in the United States, Meyer and Eddie [1] assembled pertinent information regarding laboratory infections due to Brucella. From published reports and personal communications we collected data regarding the occurrence of viral infections contracted in laboratories in the United States and elsewhere in the hope that such information would indicate where the greatest need for caution exists in work with viruses.[2] In all, 222 cases with 21 deaths were summarized. In a more recent extensive survey we recorded a total of 1,342 infections caused by a variety of disease-producing agents, and presumably acquired as a result of laboratory work in the United States during the last two decades.[3] A condensed summary of these findings is presented in Table 1. In each group of infectious agents there is at least one which outnumbers the others as the

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This article has been shortened for publication by omission of the bibliographical references, which will be included in the author's reprints.

Read in the Symposium on Occupational Health of Medical Personnel before the Section on Preventive and Industrial Medicine and Public Health at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

cause of laboratory infections. Brucellosis, hepatitis, Q fever, amebiasis, and coccidioidomycosis headed the list in their respective categories. Of the 1,342 infections disclosed by means of the survey, 39 were fatal. The highest proportion of fatalities occurred among the viral diseases, in which 4.5% resulted in death.

INFECTIOUS AGENTS

Brucellosis, tuberculosis, tularemia, typhoid fever, and streptococcal infections accounted for 72% of the bacterial infections and 31% of infections due to all types of agents. With the exception of Pasteurella tularensis these are agents which are extensively handled in many laboratories. Considering the relatively small number of laboratory workers who come in contact with P. tularensis, the 65 cases of laboratory-acquired tularemia would indicate a high theoretical attack rate. The large number of infections due to members of the Brucella group of micro-organisms would support the general contention that these organisms are eminently dangerous to the bacteriologist.

A large proportion of the 95 cases of hepatitis have occurred in recent years. That this disease exists as an occupational hazard for physicians, nurses, technicians, and other persons handling human blood or blood products has been emphasized by several investigators [4] who suggest that these infections should be regarded as compensable under industrial insurance. Hinton [4d] calls attention to acute infectious hepatitis as a hazard for workers in blood-testing laboratories. Several institutional outbreaks account for a large proportion of the cases of Q fever.[5] None of the 18 cases of amebiasis, which outnumber the other parasitic infections presumably acquired in the laboratory, could definitely be established as having originated in the laboratory. It is of interest that the single case of accidental infection caused by Leishmania donovani is believed to be the only reported case of leishmaniasis originating in the United States and the only reported case of an accidental infection in a laboratory worker due to this parasite.[6] Cases of laboratory-acquired coccidioidal infection are reviewed by Smith,[7] who emphasized the hazard of acquiring this and other mycotic infections in the laboratory, and suggests that the environment of a laboratory in which Coccidioides is handled is comparable to that of a coccidioidal endemic area.

TABLE 1.—*Distribution of Cases of Laboratory Infection According to Type of Personnel and Work Performed*

Type of Infection	No. of Cases	Personnel Involved				Types of Laboratory Work Involved				
		Trained Scientific Personnel†	Students	Animal Caretakers, Janitors, and Others	Other Personnel‡	Diagnostic	Research	Production of Biologics	Classwork	Combination of Activities
Bacterial	775 (19)*	570	63	89	47	333	132	5	29	276
Viral	265 (12)	218	0	23	0	86	81	20	0	78
Rickettsial	200 (6)	149	0	15	15	3	67	0	0	130
Parasitic	39	37	0	1	1	16	17	0	0	6
Fungus	63 (2)	36	0	4	23	17	11	0	0	35
Total	1,342**	1,010	63	132	86	455	308	25	29	525

* Figure in parentheses indicates number of deaths.
† Including research assistants, professional and technical workers, and graduate students.
‡ Including clerks, maintenance workers, occasional visitors, and others.
** Of these, 51% were definitely acquired in the laboratory; 40% were probable and 9% were possible laboratory infections.

TABLE 2.—*Sources of Laboratory-Acquired Infections*

Type of Infection	Clinical Specimens	Autopsy (Including Known Accidents)	Aerogenic	Contact with Infected Animals and Ectoparasites	Worked with Agent*	Handled Discarded Glassware and Other Apparatus	Known Accidents					
							Involving Needle and Syringe	Pipetting	Spilling and Splashing of Viable Organisms	Injury with Broken Glass, and Other Apparatus	Bite of Animal or Ectoparasite	Total
Bacterial	83	92	23	82	164	15	40	29	39	29	18	146
Viral	75	6	25	27	67	0	8	4	13	3	2	30
Rickettsial	0	0	89	25	27	4	6	0	3	1	5	15
Parasitic	17	0	1	5	6	0	1	0	2	0	6	9
Fungus	0	0	35	0	10	1	2	0	4	1	1	8
Total	175	98	173	139	274	20	57	33	52	34	32	208*

* In 7 additional cases the nature of the accident was not indicated.

DISTRIBUTION OF INFECTION AMONG LABORATORY AND OTHER WORKERS

It can be seen that by far the largest proportion of infections occurred among professional and technical workers, research assistants, and graduate students. Only 63 instances of infection were reported among undergraduate students or medical or veterinary students, and 132 occurred among nontechnical personnel including animal caretakers, janitors, and dishwashers. Hinton [4d] reports that 50% of those engaged for more than one year in washing glassware or other articles containing blood were infected with the agent of acute infectious hepatitis. Three cases of Q fever occurred in laundry workers handling laundry contaminated in the laboratory.[8]

At least 86 infections occurred among persons indirectly associated with work involving infectious agents, such as clerical and maintenance workers and occasional

visitors. The first known human infection with the agent of Q fever in the United States occurred in a scientist who was visiting a laboratory engaged in work with the agent.[9] Another infection with this agent was acquired in a similar manner.[10] Smith [7] also refers to the occurrence of coccidioidal infections acquired by visitors to his laboratory.

It is evident from the results summarized in Table 1 that the greatest number of infections occurred in persons engaged in diagnostic work. This does not imply that this type of work involves the greatest risk, since it is obvious that more persons are engaged in diagnostic work than in other types of laboratory activity. At least 308 infections occurred among those known to have been associated with research activities. The small number of infections reported among persons concerned with the production of biologics probably represents only a small proportion of those which have occurred. Of the 29

TABLE 3.—*Estimated Incidence of Laboratory-Acquired Infections in Various Types of Laboratories and Among Various Types of Personnel*

	Estimated Average No. of Persons at Risk Annually	No. of Infections Recorded in 20 Yr.	Attack Rate Per Yr. Per 1,000
Type of Laboratory			
Research institutes	2,948	267	4.1
Public health laboratories	12,157	169	0.7
Hospital laboratories	36,212	428	0.6
Biologic manufacturers	5,022	54	0.5
Agricultural and veterinary schools and experimental stations	10,145	94	0.5
Colleges and medical schools	45,641	281	0.3
Clinical laboratories	8,788	41	0.2
Total	120,913	1,334	0.5
Type of Personnel			
Trained scientific personnel	50,388	1,005	1.0
Animal caretakers, janitors, dishwashers	15,134	132	0.4
Students (not engaged in research)	51,005	63	0.1
Others	4,381	86	1.0
Total	120,913	1,286*	0.5

* In 48 cases the occupation was not indicated.

infections resulting from classwork, 13 were typhoid fever. In many instances an infection occurred in a person involved in a combination of activities including the production of biologics and research or diagnostic work.

In Table 2 the probable sources of the laboratory-acquired infections are summarized. In a large proportion of instances the source was not known, yet there is indication that the person had worked with the agent concerned. At least 173 infections seemed to result from aerogenic transmission of the agent, though in many instances this could not be definitely established. Contact with infected animals and ectoparasites accounted for more infections than did the handling of discarded glassware and other apparatus. The 98 infections which resulted from postmortem examinations of human beings included known accidents. Many of the known accidents, however, involved self-inoculation or spattering of infectious material while using a needle and syringe. The second largest group of accidents resulted from the spilling and spattering of viable organisms through careless handling of culture flasks and other equipment. At least two psittacosis infections resulted from handling broken vials of lyophilized virus. Seven infections are attributable to the use of the Waring Blendor; two of typhus and one of rickettsialpox occurred in the absence of known accidents, while three infections with psittacosis virus and one with typhus Rickettsia were due to known accidents with this apparatus. Of the 33 known accidents resulting from the aspiration of infectious material through pipettes, 11 resulted in typhoid. Most of the 32 accidents resulting from the bites of animals or ectoparasites occurred among the rickettsial diseases. Accidents which result from the handling of broken glass, and other apparatus occurred largely among dishwashers.

In order to obtain a reasonably accurate impression of the risk of infection involved in laboratory work it is necessary to consider the number of instances of laboratory-acquired infection in proportion to the total number of workers at risk who escape infection. Questionnaires used in the survey were designed to obtain information regarding total numbers of laboratory personnel both in laboratories where no infection had occurred as well as in those reporting cases. Of the 4,472 questionnaires sent out, 2,143 were returned. In 1,662 of these the total average annual number of all kinds of laboratory workers in contact with infectious materials reported was 33,587. In an attempt to use this figure as a basis for arriving at a reasonable estimate of the total population at risk, it was necessary to make certain assumptions. If one assumes that 75% of all laboratories in the United States received questionnaires and that the number of persons reported by the 1,662 laboratories represents a proportionate sample of the total number of persons involved, then the average annual number of persons at risk for the past 20 years would be 120,913. By making similar assumptions it was possible to arrive at an estimate of the number of persons working in various types of laboratories and in different kinds of activity.

When the number of cases of infection recorded was considered in relation to the estimated number of persons at risk, the attack rates indicated in Table 3 were obtained. These rates are at best rough estimates, but they probably approximate the relative risks in the various situations indicated. As might be expected, the highest attack rate was found in institutions devoted almost exclusively to investigative work in which an individual may be exposed to the danger of infection with a given agent daily for prolonged periods. In teaching institutions the low rate among students who come in contact with infectious agents only in classwork is offset by the higher rate among persons working in research laboratories in the same institutions. The rate for clinical laboratories not associated with hospitals is low, probably because many of these are small laboratories where an individual may spend a large portion of his time working with materials that are noninfectious.

The attack rates in Table 3 were calculated on the basis of the presumed laboratory-acquired infections that have come to our attention. Additional infections of which we have no knowledge have certainly occurred. This fact would tend to make the calculated rates lower than they should be. It is also obvious that the rate will vary according to the type of agent being handled. It is

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interesting to note that the theoretical attack rate suggested by Wenner and Paul [11] for poliomyelitis presumably acquired in the laboratory is comparable to the attack rate indicated in Table 3 for research institutes.

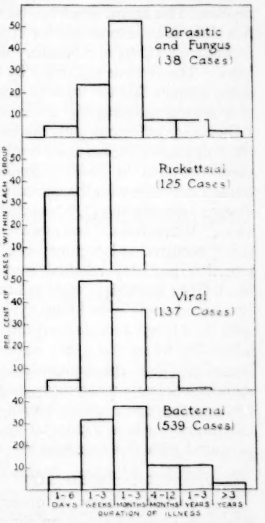
The duration of illness is a matter of considerable importance not only to the laboratory worker but also to employers. Such information was provided either in the questionnaires returned or in published records in 839 instances of nonfatal infection. The distribution of these infections with respect to duration of illness is shown in the figure. Among those infected with bacteria, 63% were ill for one month or longer. The distribution of parasitic and fungus infections is similar. The illness lasted as long as a month in 45% of the viral infections and in only 9% of the rickettsial infections. The longer duration of bacterial infections is in part owing to cases of brucellosis and tuberculosis. One contributing factor in the relatively short duration of rickettsial illnesses is the fact that a number of these infections occurred in immunized persons. It is apparent from this analysis that the time lost from work has been considerable. An average of 65 days was lost from employment by the 16 patients with homologous serum jaundice reported by Trumbull and Greiner.[4b] The economic loss involved for the patient with coccidioidomycosis is emphasized by Looney and Stein.[12] One patient was confined to a hospital for a period of 17 months.

CONDITIONS UNDER WHICH INFECTION MAY OCCUR

The results of the survey indicate that infection may occur under conditions that have, until recently, been considered innocuous. Investigations conducted at Camp Detrick, Md., and elsewhere indicate that aerosolization of infective agents may create unrecognized hazards.[13] By using sieve-type air samplers placed around the laboratory working area, investigators at Camp Detrick were able to determine that bacterial aerosols were released during such common laboratory procedures as the removal of stoppers from dilution bottles, removal of wet plugs from broth culture tubes, and the removal of infectious material from a vaccine bottle by means of a hypodermic syringe. It has also been shown that bacterial aerosols are produced during the process of pipetting, pouring, and vigorous agitation of dilution blanks. The production of aerosols by these and other laboratory procedures has been demonstrated by means of high-speed photography in studies conducted by Johansson and Ferris.[13a] The expulsion of a stream of liquid from a syringe while inoculating the exposed chorio-allantoic membrane of the developing chick embryo, or the intranasal inoculation of experimental animals, may cause the formation of aerosols which may bring about human infection by way of the respiratory tract. Numerous infections have no doubt occurred through the aerosolization of contaminated bedding in animal cages. Stein and Rogers [13d] demonstrated that viable spores may escape into the atmosphere when suspensions of Bacillus anthracis or Bacillus cereus are heated in open containers. More recently these investigators [13e] showed that viable bacteria or viruses may be present in the vapor removed by high vacuum desiccation from frozen suspensions of biologic materials, a procedure now widely used in many laboratories.

It is apparent from these data that aerosolization of infective material resulting in the aerogenic transmission of disease-producing agents must actually account for a larger proportion of the infections than is indicated by the survey. Recognized accidents, for example, seem to account for only a small proportion (16%) of infections, and many (274) infections which occurred in persons who were known only to have worked with a given agent were undoubtedly aerogenic.

Even though many pathogens are known to decrease in their virulence for the natural host after a number of animal passages, one must maintain continuous vigilance against laboratory infections. A number of incidents serve to emphasize the fact that many disease-producing agents retain their virulence for man even after many animal passages. There is evidence, for example, that the Nichols strain of Treponema pallidum has retained its virulence for man after repeated rabbit transfers over a period of many years.[14] Similar evidence is available for a number of viral agents which have been through numerous animal passages.[15] On the other hand, each of the three cases of poliomyelitis acquired in the laboratory occurred in persons exposed to virus recently isolated from human cases.[15a] No infections occurred at a time when the majority of work on experimental poliomyelitis was carried out with strains that were well established in the monkey.[11] Repeated passage of many viral agents in chick embryo tissues may result in decreased virulence for the natural host.[16]



Percentage distribution of cases according to duration of illness.

Exposure to pathogens or even accidents with infectious materials do not necessarily result in laboratory infections. Tager and his associates,[17] for example, have escaped even inapparent infection while doing investigative work with Coccidioides immitis. In at least one instance no overt infection followed introduction of sputum containing tubercle bacilli into the mouth, but the tuberculin test subsequently became positive.[18] A similar situation resulted following the ingestion of living Brucella organisms; no overt infection resulted but the development of a positive skin test indicated inapparent infection. In a few instances laboratory workers showed no evidence of illness following the aspiration of viable typhoid bacilli. However, although the accidental inges-

tion of viable typhoid bacilli will usually result in an overt though modified infection even in the immunized individual, there is evidence that prompt prophylactic use of sulfadiazine followed by chloramphenicol may prevent the development of clinical signs of infection.[19]

In a number of instances a disease-producing agent was first recognized as a cause of disease in man as a result of a laboratory infection. Actually the first known human infection in the United States with the agent of Q fever occurred in a laboratory in which the agent had been isolated from ticks.[8] Even the most recent addition to the Rickettsia group, Rickettsia akari, and to the viral group, the Coxsackie virus, have been responsible for laboratory infections.[20] The discovery of a new neurotropic virus resulted from the death of a research worker who was bitten on the hand by an apparently healthy monkey while engaged in experimental work on poliomyelitis. This agent, which has been designated B virus,[21] has since been responsible for at least two fatal cases of ascending myelitis in laboratory workers handling monkeys.[22] The B virus is carried by monkeys in much the same manner that the virus of herpes simplex, to which it is related antigenically, is carried by human beings.[23] Laboratory infections with the virus of louping ill were the only known human cases until two naturally acquired cases occurred in 1948.[24] Similarly, the first definite human infection with the causative agents of Aujeszky's disease (pseudorabies),[25] Newcastle disease of fowl,[26] D virus,[27] Vibrio fetus,[28] and more recently vesicular stomatitis [29] occurred as laboratory infections. A single human infection probably resulted from the bite of infected black flies (Simulidae) used in Leukocytozoon transmission experiments in ducklings.[30] The first human infection with the Mengo encephalomyelitis virus occurred in the laboratory where this agent was originally isolated from rhesus monkeys, the mongoose, and from mosquitoes.[31] Although Serratia marcescens is ordinarily considered to be nonpathogenic,[32] at least four infections occurred in laboratory workers incidental to exposure to aerosols produced with this organism.[33]

RECOMMENDED SAFETY MEASURES

The numerous cases of proved laboratory-acquired infections should impress on clinicians and hospital administrators the importance of giving consideration to the health and welfare of laboratory workers who are engaged in the handling of infectious material. Safety measures are being recommended [34] and numerous devices are being invented to protect laboratory personnel and to minimize infections which result from the production of infectious aerosols. An important item is the provision of adequate animal inoculating boxes or transfer cabinets properly equipped with ventilating devices for the control of aerosols. A number of workers have developed safety equipment of this type.[35] To minimize the risk to laboratory workers who inoculate animals by the intranasal route, van den Ende [35a] designed an inoculation box which prevents the distribution of infective droplets into the air during this type of operative procedure. The device, which serves for studying the extent of pollution of the air frequently accompanying intranasal inoculations, consists of a constant draft produced by a gas burner with incineration of the contaminated air. Using this cabinet as a basis, Shepard and his associates [35b] described a protective cabinet for the infectious-disease laboratory designed especially to house electrical equipment such as Waring Blendors and mechanical mortars which may be a source of danger. A protective cabinet for use by investigators studying Coccidioides immitis and other infectious fungi was designed by Keeney.[35c] Although the highly infective nature of the chlamydospores of C. immitis is recognized, and several infections are known to have occurred in persons who were not working directly with the fungus,[36] no known infections have occurred in the laboratory where this cabinet had been in use for at least two years, and skin reactivity to coccidioidin developed in none of the personnel. Smith,[7] however, had little success with a cabinet of similar design.

Recognizing the hazard involved in experimental work with plague bacilli, Meyer and his associates [37] constructed an inoculation chamber to protect the experimenter from risk of exposure following intranasal animal inoculation. Animals remain in the chamber which is treated with a propylene glycol aerosol before they are removed to a special isolation room. Smith [7] is using a protective chamber similar to that described by Meyer and his workers [37] when handling cultures of Coccidioides immitis on solid media especially when susceptibles are present in the same building. To limit the hazard of working with this agent, Looney and Stein [12] seal culture plates suspected of containing this fungus and examine them after autoclaving the plate. Several others recommended moistening the culture on solid media before making transfers.[38] One of these investigators [38b] wets the fungus with tween* 80 in saline before making transfers to solid media. Another [38c] moistens the organism which is cultured on slants by plunging through the cotton plug a sterile needle attached to a syringe containing saline, thus reducing the chance of liberating a cloud of spores when the plug is removed.

Aspiration of infectious fluids through a pipette is one of the well-recognized, obviously dangerous mishaps. Several devices have been developed to reduce the dangers of getting such infectious fluids into the mouth. A common practice is to plug the proximal end of the pipette with absorbent cotton. A pipetting device designed by Wedum [39] obviates the need for direct oral suction on the pipettes and is better than the commercially available pipettes designed for this.

The 80 cases of viral hepatitis resulting from diagnostic work originated mostly from specimens of blood submitted for serological or chemical examination. It has been suggested that most of these infections can be prevented through the use of rubber gloves [40a, d] and that all specimens of blood, urine, and feces from a patient with viral hepatitis should be labelled "infectious" and "handle cautiously." [40] To minimize infection with Coxiella burnetti among laboratory personnel, Meikeljohn and Lennette [41] have eliminated such procedures as centrifuging and blending, and use separate buildings or cubicles for infected animals. In addition, they maintain triethylene glycol aerosols in workrooms and in animal houses. These procedures, in addition to immunization with a C. burnetti vaccine, have virtually eliminated the hazard of working with this agent.

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Prophylactic immunization is available for many of the agents that have been responsible for laboratory infections. Immunization procedures, however, do not necessarily eliminate the risk of infection though there is evidence that infections which have occurred in immunized persons tend to be less serious.[42] In at least one instance no infection followed the accidental ingestion of approximately a billion virulent typhoid bacilli in a previously immunized person who received sulfadiazine and chloramphenicol shortly after the accident had occurred.[19] Kadull and his associates [42c] present convincing evidence of the efficacy of vaccine prophylaxis in tularemia among laboratory workers. Immunization with psittacosis virus vaccine has been suggested, but the effectiveness of this procedure has not been definitely demonstrated.[43] Immunization is recommended for those persons undertaking work with equine encephalomyelitis viruses [44] or with the agent of Q fever.[41] Also, BCG may afford some protection. Stokes and his associates [45] recommended prophylactic treatment with periodic injections of immune globulin in persons exposed to specimens from patients with viral hepatitis. The procedure is used in at least one laboratory processing blood.[38]

The prompt use of currently available chemotherapeutic agents should insure recovery and shorten the time of illness in the case of many infections.[46] Administration of sulfadiazine in pneumonic plague,[47] penicillin in anthrax,[48] and chloramphenicol in Q fever [10] are examples of successful therapy in laboratory infections.

SUMMARY

Although the problem of occupational hazards has been recognized in industry for many years, there has been until recently no recognition of these hazards as they apply to laboratory workers. Recent surveys by the authors have indicated that persons who work in research and diagnostic laboratories may be exposed to hazards of infection far beyond those met in ordinary living; the data in these surveys disclose numerous dangers frequently unrecognized in the laboratory.

Laboratory infections have been acquired from all categories of infectious agents—bacteria, viruses, rickettsiae, parasites, and fungi. They have been acquired by professional and technical workers, students, clerical and maintenance workers, and even by visitors to laboratories; and the resulting illness has varied in severity from inapparent infections to those with a fatal outcome.

Efforts are being made in numerous laboratories throughout the country to develop safety measures to reduce the incidence of these infections. Various types of ventilating devices, inoculating cabinets, and techniques for the handling of infectious material are in use in many institutions. In some laboratories available vaccination procedures are in routine use. Laboratory workers should be acquainted with the potential sources of infection and encouraged to make use of available safety measures wherever indicated.

Southwestern Medical School, University of Texas (Dr. Sulkin).

RADIOISOTOPE HAZARDS AND PROTECTION IN A HOSPITAL

Marshall Brucer, M.D., Oak Ridge, Tenn.

In January, 1949, the Oak Ridge Institute of Nuclear Studies organized a Medical Division with a primary function of exploiting radioisotopes in the field of medicine. At that time many medical schools had experience in using radioiodine and radiophosphorus, but there was little experience available in the large-scale use of radioisotopes. In a few instances three or four different radioisotopes had been used, usually in small volume, but only in a very few places had many different isotopes been used in significantly large volume to produce hazardous operations. Thus, the problems involved in the use of a large number of radioisotopes simultaneously in a large number of patients were relatively unknown. Most of the anticipated problems were based on the exposures encountered in the production and research facilities of the Atomic Energy Commission and were of a totally different nature than those of a hospital-type operation: In general, they were experiences of protective problems, orders of magnitude beyond even the largest medical-type usage.

However, the problem is rapidly becoming more than that of a potential hazard. Since Aug. 2, 1946, when the Isotope Division of the Atomic Energy Commission began its isotope distribution program,[1] the distribution of isotopes for direct medical purposes has grown from a few shipments to well over 800 shipments monthly. This rapid growth of radioisotope usage explains the frequent revision of viewpoint on the design of processes and equipment. Ideas on how to handle radioisotopes are still in a state of flux, and sometimes the changes are disconcertingly radical. A current, pertinent example is the question of the best materials to be used for easily contaminated laboratory table tops. During 1950, stainless steel with a high polish was the accepted material. Such old-fashioned materials as alberene* soapstone were "out of the question." Nevertheless, a testing program during the past year seems to indicate that stainless steel is one of the most difficult of all materials to decontaminate while soapstone can be cleaned readily with a piece of emery paper. Under many conditions, a few inches of space are not critical, and with these few added inches soapstone absorbs radiation as effectively as does lead and acts as a shield in addition. It is very probable that within the next few years the relative usefulness of alberene* soapstone, lead, and stainless steel for various purposes may change considerably.

An equally radical change in opinion is developing around the design of hospital radioisotope wards. As long as only one patient receives a relatively small dose of radioiodine, no hazard is involved. However, when many

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Read in the Symposium on Occupational Health of Medical Personnel before the Section on Preventive and Industrial Medicine and Public Health at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

1. AEC Contract Policy and Operations, United States Atomic Energy Commission, United States Government Printing Office, Jan., 1951, p. 30.

patients are being treated with different isotopes in relatively large quantities, a significant exposure hazard results. Under these conditions the question of shielding patients from the staff and from each other must be considered.

TABLE 1.—*Isotopes Used in the Medical Division, Oak Ridge Institute of Nuclear Studies, First Year of Operation, 1950-1951*

Radioisotope	Half-life	Shipments	Quantity (Millicuries)
Gallium ^{72}	14.3 hr.	158	10,920
Gold ^{198}	2.7 days	35	6,858
Iodine ^{131}	8 days	42	3,715
Cobalt ^{60}	5.3 yr.	5	2,220
Antimony ^{122}	2.8 days	15	267
Potassium ^{42}	12.4 hr.	1	125
Sulfur ^{35}	87 days	5	114
Phosphorus ^{32}	14.3 days	16	110
Hafnium ^{181}	46 days	4	100
Sodium ^{24}	14.8 hr.	10	90
Ruthenium ^{106}	1 yr.	4	50
Indium ^{114}	48 days	3	30
Manganese ^{54}	310 days	1	10
Cobalt $^{56-57}$	270 days	2	10
Carbon ^{14}	5,100 yr.	1	5
Nickel ^{63}	300 yr.	1	3
Zirconium ^{95}	65 days	1	1
Gallium ^{67}	78 hr.	1	1
Totals 18 Radioisotopes	.....	305	24,029 curies

The medical program of the institute is chiefly concerned with the therapeutic value of radioisotopes in cancer therapy. This necessitates the use of relatively large doses of radioactivity. Concomitant studies relating to diagnostic and tracer use have brought about the use of a wide variety of radioisotopes. Thus, during the first full year of operation of the institute hospital, 18 different radioisotopes have been employed, totaling almost 25 curies of radioactivity (Table 1). The dosage in individual patients ranged from microcuries to almost a curie. This year's operation has provided a basis for discussion of the contamination and radiation protection problems to be encountered in a small hospital-type operation and designs for protective measures which appear to have practical usefulness.

POSSIBLE EXPOSURE WITHIN PATIENT AREAS

Of the total amount of radioactive substances brought into the hospital area, only a fraction create a potential hazard. During transportation, chemical preparation, and storage the activity is well shielded and the problems are mostly those of laboratory design and engineering. It is after the material is injected into a patient that the major problem arises.

It is too early to be dogmatic about whether or not a radioactivity exposure represents a hazard because there are too few data and too many opinions as to how much exposure should be allowed. But as a starting point in setting up regulations for personnel protection the recommendations of the Chalk River Conference on permissible doses were adopted.[2] The working assumption was that all personnel would spend the rest of their lives with some exposure to radioactivity. Therefore, for chronic exposure of the total body, the maximum permissible dose in the critical tissue (bone marrow) should be 0.3 rep per week. This is considered equivalent to 6.25 milliroentgens per hour, or 60 milliroentgens per working day.

If personnel work only in levels of radiation lower than 6.25 milliroentgens per hour, there will be no question of either moral or legal aspects of the hazards of radiation exposure. Accordingly, the question that remains is that of the practicability of carrying out normal hospital procedures under conditions giving doses no higher than this level and preferably giving the least possible exposure.

When a patient has received a radioactive substance which emits gamma rays, it is possible to measure the exposure around the patient with reliable, standardized instruments. When measuring a field of unknown radiation it is proper to use an ionization chamber because of its relative wave length independence. However, ionization chambers are less adaptable to untrained personnel and the inaccuracies introduced with other methods are negligible in routine patient surveys. The instrument designed for use by the nurses of the institute's Medical Division (Fig. 1) is a portable Geiger-Mueller type monitor powered by batteries mounted in a plastic container. It weighs 6½ lb. (2.9 kg.). This survey meter, called the "Poppycock," has a light which flashes with each count, a loud speaker which clicks, and a dial for reading exposures. By use of a spring switch the machine can be set for "prospecting" for low level exposure fields or for surveying high level exposures. When "prospecting," only the light and the speaker are operating, but when "surveying," the scale is in the circuit so as to provide a means of estimating the level of radiation.

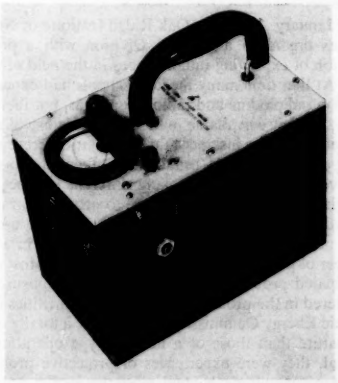

Fig. 1.—Nurses' radiation protection meter, "Poppycock," Oak Ridge Institute of Nuclear Studies.

Instead of calibrating the scale of the meter in milliroentgens, green, yellow, and red colors are painted on to give indication of tolerable, warning, and dangerous levels. When the pointer reads in the green area, the nurse has instructions that with most isotopes there are no restrictions on work hours, visitors, and probably no

2. Unofficial Notes from the Minutes of the Permissible Doses Conference held at Chalk River, Ontario, Canada, Sept., 1949. This material here quoted has been later amplified and in substance substantiated by the International Commission on Radiological Protection, London, July, 1950. See Nucleonics 1: 8 (No. 1) 28-37 (Jan.) 1951.

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restrictions on sample collections of urine, feces, blood, and linens. When the dial reads in the yellow area, there are no restrictions on work hours and visitors but there are probably some restrictions on sample collections from the patient. When the dial reaches the beginning of

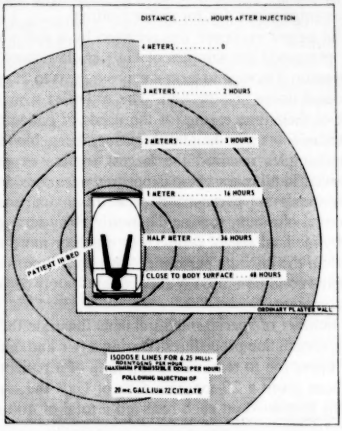
DISTANCE..... HOURS AFTER INJECTION
4 METERS..... 0
3 METERS..... 2 HOURS
2 METERS..... 3 HOURS
1 METER..... 16 HOURS
HALF METER..... 36 HOURS
CLOSE TO BODY SURFACE..... 48 HOURS
PATIENT IN BED
ORDINARY PLASTER WALL
ISODOSE LINES FOR 6.25 MILLI-ROENTGENS PER HOUR (MAXIMUM PERMISSIBLE DOSE PER HOUR)
FOLLOWING INJECTION OF
20 mc GALLIUM 72 CITRATE

Fig. 2.—Maximum permissible isodose lines for 20 mc. gallium[72].

the red scale, the dosage is at 6.25 milliroentgens per hour. This point reads the only true calibration on the scale relative to radium. Beyond this point, there are time restrictions on working hours. Visitors must be restricted to short visits. All sample collections and waste materials must be monitored by a qualified person. In some cases the nurses themselves are qualified to use a standard survey meter to assess the extent of the restrictions.

After a patient is given some radioactive substance, a line can be drawn around the patient at the points where the radiation in the air measures 6.25 milliroentgens per hour; this line is called the hourly maximum permissible isodose line (Fig. 2). Immediately after injection of 20 mc. of gallium 72 citrate, this isodose line is approximately a circle 4 meters from the center of the patient. Because gallium 72 has a very short half life (14.3 hours) and is excreted in the urine rapidly, this isodose line regresses toward the patient rapidly. In 2 hours the maximum permissible isodose line is 3 meters from the patient; in 16 hours the line is at 1 meter; after two days, it is close to the surface of the body so that there is little hazard to the nurses, aids, and orderlies carrying on ordinary hospital routines.

Most of the gamma emission of Ga^{72} is of high energy or "hard." About 25% of the gamma rays are over 2.5 mev; about 50% are over 2 mev. Ordinary hospital plaster walls provide almost no shielding; therefore, other persons must be kept away from adjacent hallways and ward rooms. Other patients getting radioactive therapy will probably receive only a negligible fraction of their own dosage from exposure to a gallium patient, but patients not under radioactive therapy must be shielded from active patients.

In another example, a patient received 200 millicuries of radiogold (Au^{198}) intrapleurally. Compared to gallium, Au^{198} emits a much softer gamma ray and fewer rays per disintegration. Hence, it is much easier to shield. Ordinary plaster walls have some shielding value but are not adequate with large doses. However, because its half life is longer (2.7 days), the maximum permissible isodose line regresses toward the patient much more slowly. In the example shown in Figure 3 the isodose line for 6.25 milliroentgens per hour was a meter from the patient a week after injection and did not approximate the body surface until two weeks had passed. During this time, according to definition, the area around the patient is an area of radiation hazard. Time spent close to the patient by any of the staff must either be reduced to a minimum and/or the patient shielded.

Shielding can be accomplished in many ways. Probably the simplest is to build the walls of certain rooms of dense concrete and use such rooms as private rooms. Under such conditions the problem is almost nonexistent in dosages used so far. A less expensive substitute for this ideal shielding is to erect a double layer of 4 in. (10 cm.) marble slabs up to the 6-ft. (182.8 cm.) level on critical walls. This was done in the Medical Division hospital in one critical area where a physician's office adjoins a private patient's bedroom. Another simple protective shield shown in Figure 4 is made of a 2 in. (5 cm.) slab of armor plate mounted on casters and upholstered. The large shield is 6 ft. long and 3 ft. (91.4 cm.) high; the small one is 3 ft. by 3 ft. When placed L-shaped around a patient's bed the radiation is reduced to negligible levels. Highly radioactive patients are placed

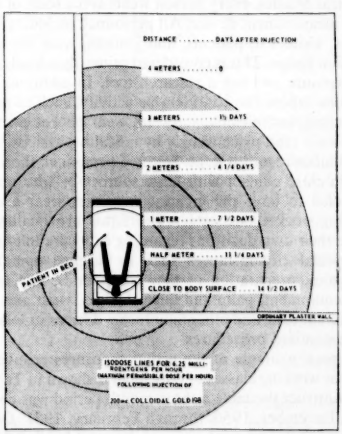
DISTANCE..... DAYS AFTER INJECTION
4 METERS..... 0
3 METERS..... 1½ DAYS
2 METERS..... 4 1/4 DAYS
1 METER..... 7 1/2 DAYS
HALF METER..... 11 1/4 DAYS
CLOSE TO BODY SURFACE..... 14 1/2 DAYS
PATIENT IN BED
ORDINARY PLASTER WALL
ISODOSE LINES FOR 6.25 MILLI-ROENTGENS PER HOUR (MAXIMUM PERMISSIBLE DOSE PER HOUR)
FOLLOWING INJECTION OF
200 mc COLLOIDAL GOLD 198

Fig. 3.—Maximum permissible isodose lines for 200 mc. gold[198].

along outside walls and are kept in bed during the period of greatest radioactivity. With an L-shaped shield added, the potential hazard is reduced to a minimum.

The amount of radiation exposure to an attendant remaining close to the bed-side of high dosage patients is considerable. At approximately 1 meter from the patient during the entire course of intracavitary gold

therapy, over 10 r of 400 kv. radiation was calculated. Hence, a nurse sitting next to the patient could be expected to absorb 1 r of total body exposure in three days. The nurse of a patient treated with 100 mc. of iodine would receive about 1 r of exposure in five days, and with 50 mc. of gallium the nurse could be exposed to 1 r in about two days.

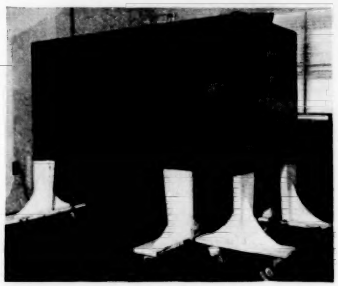

Fig. 4.—Movable bed shields for radioactive patients, Oak Ridge Institute of Nuclear Studies.

While such exposures may be of no immediate hazard if taken once and never repeated, they are intolerable as a working basis for personnel who make even a short-term career of handling radioactive patients.

ACTUAL PERSONNEL EXPOSURE

In the Medical Division of the Oak Ridge Institute of Nuclear Studies, every person wears some form of exposure measurement device. All personnel, including secretaries, visitors to patients, and janitors, wear the standard film badge. This is considered primarily a legal record of exposure and not a research tool. In addition, those persons exposed to considerable activity, such as nurses, processing technicians, and staff, wear pocket chambers which are read twice weekly by a health physicist, and a continuous record is kept. Selected personnel, those who are in close contact with large sources or who may be expected to have the greatest exposure, wear a direct reading pocket dosimeter. The latter are qualified to make their own decisions regarding exposure tolerances. In special circumstances such as surgical operations, autopsies, preparation of new compounds, and testing new equipment, palm and finger badges, wrist and forehead chambers, and other monitoring devices supplement these standard procedures.

A good example of the actual exposures received by various working classes of personnel is shown in Table 2. To construct the table a three-month period was considered, December, 1950, through February, 1951. During the period there was an average hospital load of 17 patients undergoing some type of radiation therapy. The isotopes brought into the hospital area, except for some long-lived materials already present, were 3.98 curies of Ga^{72}; 2.12 curies of Au^{198}; 1.11 curies of I^{131}; 0.04 curies of P^{32}; 0.02 curies of Na^{24}.

Only the routine film badge data are shown since all personnel wore the film badge. The films measure the total integrated dosage over a set period with readings for hard and soft gamma radiation; in this instance they are returned weekly. The open window reading is an index of the less penetrating radiation exposure and the shielded window is a better index of exposure to more penetrating radiation. By this method of measurement the maximum permissible dose is considered to be 60 milliroentgens per day for either reading.

The largest exposure was received by a staff chemist who processed the samples of Ga^{72} as they came from the reactor. The second largest exposure was to the chemistry technician helping him. The orderlies who spend most of their time caring for the needs of patients, and the technicians who handle the urine, feces, blood, and tissue samples received the largest routine exposures. However, in all cases, these exposures were considerably below maximum permissible levels. In comparison, the personnel of a busy routine diagnostic x-ray service in a nearby medical school received as much or more radiation than the institute personnel. This level is considered a normal condition in x-ray services and rarely occasions any comment.

A number of special measurements illustrate the hazard in nonroutine procedures. During a two and one-half hour operation to remove the left lung of a patient who had been given a 20 mc. test dose of Ga^{72} the surgeon and his first assistant each received a total of 400 milli-

TABLE 2.—*Exposure of Selected Personnel Measured by Routine Film Badges over a Three-Month Period* *

Type of Work	No. with Blank Badge †	No. Exposed	Average Milliroentgens/Day Exposure. Open Window	Average Milliroentgens/Day Exposure. Shielded Window ‡	Largest Average Exposure in Group, Milliroentgens/Day
From Medical Division, Oak Ridge Institute					
Staff (M.D. or Ph.D.)	3	10	9.1	9.1	55.7
Part-time staff	1	3	2.0	3.9	10.9
Technicians	2	9	10.5	11.9	28.5
Nurses	0	12	4.9	3.9	10.6
Nurses aids	0	6	4.1	3.7	5.9
Orderlies	0	2	12.2	11.4	15.9
Maids	0	2	1.8	1.8	3.1
Maintenance men	4	3	0.6	0.6	0.6
Administrative	1	4	1.5	1.3	4.2
Total personnel	11	51	6.1	6.1	55.7
From Nearby Medical Schools					
Radiology technicians	11	5	7.2	4.8	19.0
Radiologists (badge inside apron)	0	2	11.6	4.6	7.9
Radiologists (badge outside apron)	0	2	112.0	6.5	124.0

* Maximum permissible exposure by this method is 60 milliroentgens per day.

† When the exposure is less than can be measured by photographic densitometry, the badge is considered a blank and is not included in the average exposure data.

‡ Film shielded from beta and soft scattered radiation by 1-mm. cadmium shield.

roentgens to their hands according to film badges placed in the palms underneath their rubber gloves, whereas badges under their collars registered 30 milliroentgens. This difference is due in part to the rather energetic beta particles of Ga^{72} which have a maximum penetration of about 18 mm. of water. The anesthesist for this operation received total body exposure of 40 milliroentgens. In Table 3 four other operations are reviewed. When most of the isotope is confined to one location as in intra-abdominal therapy with Au^{198}, the hands of the surgeon

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can receive a significant dose. The actual radiation per disintegration is not as great as with gallium, but the quantity of radioactivity is disproportionally greater. In the second and fifth examples in Table 3 the gold was confined to the lesser omental space; in the third example it was diffusely spread over the entire peritoneum. The surgeons here received somewhat more than the "allowable" hand dosage, which is generally taken to be about five times the total body dosage. However, because such operations are not done routinely, the actual risk is minimized. In contrast, a far greater risk is in a standard implantation of radium needles shown in example 4. In another series of measurements, the average exposure to the unprotected neck and right forearm of a radiologist during two weeks of routine fluoroscopy was about 8^ milliroentgens per day. Two persons holding a baby under a 250 kv. therapy machine during three minutes exposure of 200 r each measured 60 milliroentgens on pocket chambers placed under lead aprons. It is generally true that even large amounts of radioisotopes can be handled with greater safety than is now the case in many standard x-ray and radium services.

During the chemical preparation of a radioisotope, exposure of the hands is not ordinarily registered in the routine personnel monitoring devices. For example, during the hour it took to prepare four ampules of Ga^{72} citrate, the chemist received an exposure of 530 milliroentgens on his right hand and 355 milliroentgens on his left hand. If such exposures occur during a routine operation which must be repeated a number of times each week, the equipment must be redesigned to afford better shielding and the chemist must reeducate himself to modified procedures.

A common statement is that the injection of a radioisotope can be done more safely without shielding over the syringe if the operator moves fast. At best, however, the hands are exposed to measurable amounts of radiation. The injection of 1 mc. of gallium from an unshielded syringe over 50 seconds gave 13 milliroentgens to the left hand and 15 milliroentgens to the right hand. During the injection of 20 mc. of radiogold over 60 seconds, using an unshielded syringe, the total exposure was 60 milliroentgens to the left and 50 milliroentgens to the right hand. Radioiodine gives about the same exposure as radiogold, and even radiophosphorus gives off bremsstrahlung (soft x-rays) which can help build up hand exposure to supratolerable levels. If these so-called rapid procedures are carried out once or twice a week and are the only exposures that the hands receive during the week's work, there is little or no hazard to using unshielded syringes. But when the operation is just one part of other routine exposures, the maximum permissible dose accumulates rapidly and is exceeded quickly.

TABLE 3.—*Exposure to Radioactivity During Surgical Operations (Milliroentgens Total Exposure to Hands and Body)*

Operation	Surgeon			First Assistant			Assistant or Anesthetist		
	Left Hand	Right Hand	Total Body	Left Hand	Right Hand	Total Body	Left Hand	Right Hand	Total Body
1. Laparotomy; 5 mc. Gallium^{72}, ½ hr. exposure time; diffuse source	Neg.	Neg.	10	Neg.	Neg.	10	..	..	10
2. Laparotomy; 100 mc. Gold^{198}, 2½ hr. exposure time; source in lesser omental space	155	75	40	35	35	10	50	..	10
3. Laparotomy; 100 mc. Gold^{198}, 2 hr. exposure time; source in peritoneal cavity	490	180	80	290	600	80	30	..	10
4. Implantation of Ra needles; 45 mc. radium; ½ hr. exposure time	760	450	90	360	470	90	..	..	..
5. Autopsy; 102 mc. Gold^{198}, 1½ hr. exposure time; source in peritoneal cavity	150	140	60	...	...	35	..	..	..

EXAMPLES OF SAFE HANDLING EQUIPMENT

In order to assure minimal exposure during routine operations, many devices have been designed. One of the distinguishing characteristics of radiochemical laboratories is a drawer full of homemade remote handling equipment and shielding gadgets. Many of these are better designs for specific purposes than any commercial items, for the obvious reason that the commercial houses cannot pick out a sensible compromise from the profusion of demands for specific tasks. However, now that radiochemical procedures are becoming relatively standardized, the number of commercially available devices for reducing radiation exposure is constantly increasing. The specific items described below are designs or developments of the Oak Ridge Institute of Nuclear Studies. They are not necessarily new and original and are adaptations of many persons' ideas. They have all been thoroughly tested and found adequate, and they are now commercially available to anyone.

The Shielded Syringe Holder.—The shielded syringe holder shown in Figure 5 was designed to take the maximum dimensions of the standard 10 cc. B-D glass tip or Luer lock syringes. It has two main parts, a lead shield for the syringe barrel and a plunger holder. The shield is a 5-lb. (2.3 kg.) chrome plated, hollow, lead cylinder with a projecting 4-in. (10 cm.) disk of ¼ in. (0.64 cm.) lead. The function of the disk is to shield the left hand A small slot in the cylinder end takes a plastic translucent prism and mirror, by means of which the contents of the syringe are visible at a 90 degree angle to the slot in the lead shield. A small set screw holds the plastic prism in position; it is removed during autoclaving. The plate closing the end of the cylinder is removable. On the plunger end is a thumb screw which when tightened locks down the plunger in a set position to prevent accidental discharge of syringe contents.

The plunger assembly is designed to clamp the top of the plunger so that the metal part becomes merely a rigid extension of the plunger itself; this assures perfect control of the injection. The plunger assembly also contains a pen-type flashlight battery and bulb (both sealed in); the light from this is transmitted down the plunger so as to improve greatly observation of volumes in the syringe.

The procedure for using the syringe holder is as follows: A known amount of radioactive substance is

pipetted into a small round-bottom flask. After the content of radioactivity has been standardized by means of a calibrated electroscope, the radioactive fluid is drawn up into the syringe through a large-bore needle and the set screw tightened. The needle is then removed, allowed

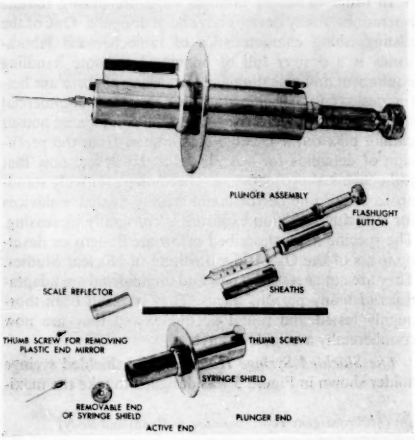

Fig. 5.—Shielded syringe holder, Oak Ridge Institute of Nuclear Studies.

to drain, and the amount of radioactive material remaining in the sample bottle is determined with an electroscope to obtain by difference the amount in the syringe. By use of another unshielded syringe containing saline, a long spinal needle is placed in the vein at the leisure of the operator. The unshielded syringe then is detached and the shielded syringe substituted. The set screw is loosened and the injection of radioactive fluid is started. The rate of injection and the presence of air bubbles can be observed through the side window by lighting the flashlight bulb. After completing the injection the contaminated glass syringe is removed from the shielded syringe holder by holding the entire assembly vertical. The entire plunger assembly plus the syringe and sheath slide out without touching the sides of the shield. The cylinderical sheath is then removed and the syringe dropped into a water-filled wastebucket without contact with the operator. With practice a contaminated syringe can be removed without contaminating the syringe holder.

This shielded syringe holder is a compromise between practicability and perfect shielding. If the device is made with good shielding power, it is too heavy to handle. If it is light it is more practical to handle but has little or no shielding power. A glass syringe will stop most of the beta emanation from radioactive isotopes. The shield absorbs the remaining betas, the bremsstrahlung, and the soft gamma emission. Little of the hard gamma component can be stopped by a shield of this thickness. However, the exposure received by the hands is reduced by a factor of approximately 100 from that in an unshielded syringe, and where the operation is sufficiently routine to constitute a hazard such a device is necessary. While this particular device was designed primarily for use with radiogold, it is useful against the weaker radiation component from any radioactive isotope. It is used satisfactorily for as much as 200 mc. of Au^{198}.

Intravenous Infusion Apparatus.—For administration of large doses of gallium (Ga^{72}) citrate intravenously, the use of a shielded syringe is prohibited by the high-energy gamma rays. Shielding during chemical preparation of the raw material requires 6 in. (15 cm.) of lead, and such shielding is obviously not feasible for portable apparatus. But under some circumstances distance, i. e., the inverse square effect, can be used in place of mass. Accordingly an intravenous infusion setup for radioactive solutions was designed which could be autoclaved, set up at the bed side, and operated at a distance (Fig. 6).

A standard parenteral fluid bottle is fastened to a stand at a slightly higher level than a shielded wide-mouth flask. The two flasks drain by gravity into parallel visual drip tubes, which in turn drain through a Y tube into a common drop tube which is connected by rubber tubing to an intravenous needle. Tubing clamps are placed so as to allow either or both flasks to drain into the intravenous needle or to allow the saline flask to drain into the shielded flask. On each tubing clamp screw there is fitted a ¼-in. (0.64 cm.) hexagonal nut which fits a "hex spintite" wrench fixed on the end of a 3-ft. wand.

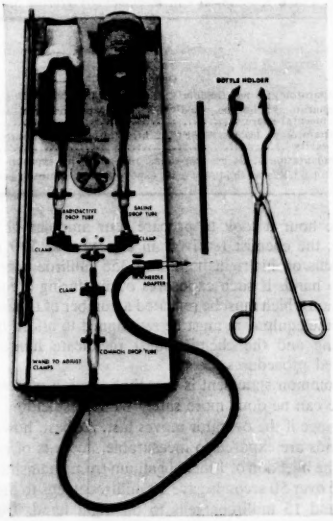

Fig. 6.—Intravenous infusion apparatus and long-handled bottle tongs, Oak Ridge Institute of Nuclear Studies.

In operation, the radioactive solution is kept behind shielding while the saline infusion is begun. When the infusion is flowing at a slow steady drip, the radioactive solution is poured into the open-mouthed flask. The usual safe distance from this time on is at 3 to 4 meters from the apparatus. By means of the 3-ft. wand the nurse controls the rate of mixture of radioactive solution and saline

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and needs to approach within 3 ft. of the apparatus only when it is necessary to make adjustments in flow. Since the radioactive fluid is usually colored with an indicator, the rate of flow through each drop tube and the intensity of mixture in the common drop tube can be observed from across the patient's room. The usual infusion takes 10 to 30 minutes. When all of the radioactive solution has been drained from the shielded flask, the common clamp is closed and saline is washed back into the shielded flask. This rinse and two subsequent rinses are drained into the patient without dilution by saline. With three rinses, only a small residual activity is left in the shielded flask and tubing; the apparatus can be safely removed from the room. The entire assembly is washed, reassembled, and sterilized in an autoclave as a complete unit ready for the next use.

With all other methods of injecting radioactive materials, the period of injection was the high point in exposure of nurses and staff. By using an apparatus such as is described the injection exposure has been made a relatively innocuous procedure. Exposure doses are negligible.

Remote Handling Bottle Tongs.—One of the most irritating problems in preparing samples for patients has been the problem of holding many different-sized bottles while caps are removed, fluids are pipetted, or needles are inserted. A simple device which has proved very useful is the bottle tongs (Fig. 6). On the end of a standard 18-in. crucible tongs, two truncated "V's" of stainless steel are fastened; one side is slightly larger than the other. Small bottles can be grasped with a positive action, and while the range of bottle sizes is limited with any one device it is sufficient for most bottles and test tubes usually used in radiochemistry laboratories. A similar but smaller design has been in use for burettes and pipettes.

Shielding Bricks.—Shielding bricks are a standard item of equipment and are furnished by almost every supply house. There have been many attempts to design interlocking joints, but most workers seem to use the standard 2 x 4 x 8 in. (5 x 10 x 20 cm.) bricks, usually made of lead containing 6 to 10% antimony. Combinations of such lead bricks are adequate for any operation. In fact, in most hospitals, lead bricks provide far more shielding than is actually required. A recent price survey on lots of one hundred such lead bricks gave prices ranging from $6 to $10 per brick. Cast iron bricks are nearly as expensive. For conditions where such intense shielding is unnecessary a substitute has been found in marble or soapstone. Four inches of soapstone is roughly equivalent to an inch of lead for high energy gamma rays. Where a few inches of space is not critical the use of stone bricks can be recommended. An additional advantage of soapstone which makes it superior to lead is that soapstone is easy to decontaminate. Since it is a nonporous material, simple honing of the surface with emery paper easily removes even heavy contamination. The prices on soapstone and marble 4 x 4 x 8 in. (10 x 10 x 20 cm.) bricks are $1.35 to $1.75 each.

SUMMARY

The use of radioisotopes in hospitals has introduced a new radiation hazard, but there is argument on the degree of hazard involved. If the maximal permissible dose is accepted as 300 milliroentgens total body exposure per week, it is possible to handle large amounts of radioactivity without overexposure to any personnel. The maximum permissible dose level of exposure is not a "safe level." Rather, the least possible exposure is the safest, but 300 milliroentgens is a maximum. Procedures and instruments can be designed so that personnel do not approach this maximal level. Such procedures need not unduly interfere with normal hospital operations. With trained personnel using common sense there is probably less radiation hazard than that found in the x-ray department.

Oak Ridge Institute of Nuclear Studies.

OCCUPATIONAL DERMATOSES IN PHYSICIANS

Ervin Epstein, M.D., Oakland, Calif.

The layman does not expect his physician to be subject to the same ills as the workingman. He is upset and confused when he learns that the doctor can not avoid illness anymore than the unionized employee. Yet, there is no occupation that subjects a worker to more dangers of potent sensitizing chemicals, or exposes him to as many virulent infections and hazards of neoplasm-producing energies than that of physician.

MATERIAL

In order to avoid giving my experiences and opinions on this subject undue weight, a simple questionnaire was sent to 75 dermatologists. Sixty (80%) paid me the compliment of replying. The statements made in this presentation, then, are a composite of the experiences recounted in these letters. This paper is divided into sections representing the four questions posed in the questionnaire.

CONTACT DERMATITIS AND ITS CAUSES

According to Dr. Marion B. Sulzberger, contact dermatitis is the condition that brings the physician to the dermatologist most frequently. In fact, he stated that seldom does a week go by during which he does not see one or more physicians or dentists in his private practice with dermatitis due to one of the causes to be discussed in this section. While the consensus was that such cases were not uncommon, most practicing dermatologists see fewer examples than this. Dr. John V. Ambler, for instance, in 33,000 patients seen over a period of 15 years, saw only seven physicians with contact dermatitis due to professional pursuits.

Read in the Symposium on Occupational Health in Medical Personnel before the Section on Preventive and Industrial Medicine and Public Health at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

Scrubbing.—The commonest cause of dermatitis of the hands in a physician is scrubbing for surgery. It is obvious that the mechanical trauma involved plus the use of strong detergents, antiseptics, and alcohol is difficult for any skin to tolerate over a long period of time. Mechanical scrubbing could be considered as a primary irritant. Dr. Richard L. Sutton put it very simply when he said, "Surgeons and dentists often scrub more than their skins will stand." On the other hand, several of the contributors felt that hexachlorophene had cut down the number of "scrub dermatitis" cases appreciably. Rare instances of sensitivity to hexachlorophene were also reported (Drs. Lester Hollander, Louis H. Winer, and William J. Morginson).

Rubber Gloves.—Another frequent cause of contact dermatitis is rubber gloves. Thirteen of the contributors stressed the importance of this. Dr. Samuel Ayres Jr. found that glove powder containing orris root was the important factor in one case. Dr. Everett C. Fox reported that in three surgeons dermatitis of the hands developed, presumably from gloves, but further investigation revealed that the actual cause was thimerosal (merthiolate®) used in "prepping" the gloves.

Local Anesthetics.—Of the local anesthetics, procaine was the usual sensitizing agent. Nupercainal® (an ointment containing 1% dibucaine hydrochloride base in lanolin and petrolatum), butacaine (butyn®) sulfate, and cocaine were also mentioned.

It was generally agreed that antiseptics were a frequent cause of this type of dermatitis. Mercurials were the most regularly noted, while a formaldehyde solution was second in frequency. The latter was contacted in cold sterilizing solutions or by pathologists.

Antibiotics.—Among the antibiotics, penicillin was mentioned five times as frequently as streptomycin or dihydrostreptomycin. At least one physician suffered dermatitis of the face after insufflating penicillin powder into a vagina.

Miscellaneous Causes.—Among the uncommon but reported causes might be listed plastic, nickel, poison-oak extract, chromium, adhesive, paper towels, plaster, and rabbit fur (in a pathologist).

It must be stressed that not all inflammatory dermatoses occurring on the hands of physicians are caused by substances contacted in their profession. Hobbies, for instance, may expose the doctor to other irritants. Also, it should not be forgotten that dermatophytids and other eruptions occur on the hands of physicians as commonly as they do in a nonprofessional group.

Psychosomatic Aspects.—Another concept, advanced by five of the contributors, stressed the psychosomatic aspects of the problem. Dr. Paul A. O'Leary pointed out that many surgeons are cured of a "rubber glove dermatitis" by a rest and are then able to continue their specialty. He feels that this sensitization is precipitated by fatigue or emotional upset. Dr. John H. Lamb postulated that many of these dermatoses are neurodermatitis caused by the surgeon's unconscious desire to give up surgery. Dr. A. Fletcher Hall recounted his experience with a physician who had a positive patch test to procaine, but in whom recurrences and exacerbations of his dermatitis resulted from emotional disturbances. Dr. Francis W. Lynch made the following statement, "It seems to me that most cases with contact factors have been on an atopic (neurodermatitic) background and the contact factors usually prove to be of secondary importance even though specific." Dr. Stephen Rothman stated, "It is my feeling that doctors with neurodermatitis constitutions are more likely to suffer from ill effects of soaps, detergents, and scrubbing than persons who were born with normally reacting skin."

However, in summary, most of the dermatologists feel that physicians, and especially surgeons, are exposed in their work to potent sensitizing chemicals and that contact dermatitis is reasonably common in this group. On the whole, occupational dermatoses are more common in nurses and dentists than in physicians.

INFECTIONS

The practicing physician is exposed constantly to organisms that have proved their virulence by infecting a patient. The pyodermas, including impetigo and furunculosis, are contagious as well as autoinoculable. Personal suffering from "boils" acquired from similarly affected patients makes me very unhappy when such a patient comes into the office. Dr. Clarence S. Livingood stated that "we have done experimental work to indicate that the bacterial population of medical students, nurses, and physicians who are in contact with patients who have cutaneous pyogenic infections is very high compared to other individuals." In surgeons, chronic paronychia may be precipitated and perpetuated by scrubbing and by perspiration under rubber gloves.

On the other hand, the spread of parasitic infestations, including scabies and pediculosis, requires more intimate contact than the usual doctor-patient relationship. Therefore, physicians are less often affected except as the result of social activities. However, four dermatologists admitted "catching scabies from patients."

Virus diseases may be acquired also from infected patients. Eight dermatologists felt that they had "caught" warts from persons that they had treated. I acquired severe conjunctivitis several days after accidental inoculation of a piece of a wart in my eye. Herpes zoster is not contagious, but contact with a patient with zoster may lead to the development of varicella. Since most physicians are exposed often to chickenpox, this infection is not common in this group. However, the head nurse on a dermatological ward developed varicella at a time when there were nine patients with zoster on her ward. There was no known exposure to chickenpox. Lynch mentioned that patients with broken skin may be infected by physicians with herpetic lesions.

Accidentally acquired venereal diseases should be uncommon in physicians. All of the venereal diseases are caused by comparatively fragile organisms. Treponema pallidum, for instance, requires a warm, moist environment with a hypoaerobic atmosphere. Such conditions are found in the mouth and genitalia, explaining the venereal nature of syphilis. In syphilis clinics, physicians are exposed constantly to patients with infectious lesions, but rarely acquire such an infection. We have all pierced our own skin with needles used on patients with syphilis, but have not acquired syphilis. The low grade of infectiousness of this disease is demonstrated by the instance of a girl with widespread mucocutaneous secondary syphilis who was "scratched to sleep" every night

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for six weeks by a bedmate who did not acquire the infection. It is felt that the risk of contracting any venereal disease from sources other than sexual intercourse, kissing, and sexual perversion is over-rated. Dr. R. B. Rees saw two physicians with syphilis, but commented that if they got their infections from patients, it was in direct violation of the Hippocratic oath.

Despite this reassuring theoretical discussion, we must exercise great care in handling patients with infectious syphilis. A total of 27 cases of extragenital chancres in physicians were reported by 16 contributors to this survey.

Among the unusual infections reported might be listed tuberculosis of the skin from autopsies in three cases, and the following in one each; tularemia, chancroid, gonorrheal bacteremia, onychomycosis, and infection of the hair on the hand from contact with tinea capitis due to Microsporum audouini.

Interestingly, 22 dermatologists, nearly 40% of those reporting, made the statement that they had seen no instances of infections of any kind in physicians resulting from exposure to patients. This is owing to a short memory or to the unwillingness of the contributor to accept such infections without fulfillment of requirements reminiscent of Koch's postulates or the old criteria for the establishment of reinfection in syphilis. One contributor stated cynically that "the only thing doctors get from patients is money." However, he certainly was not speaking about dermatologists.

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RADIODERMATITIS

Fifteen years ago, while attending my first national meeting, I was astounded to see the number of pioneer and leading dermatologists who presented clinically obvious radiodermatitis. Among my California dermatologic colleagues, one died of a carcinoma developing in an area of x-ray dermatitis. A second had his leg amputated because of malignant degeneration in this type of atrophy. The original burn resulted from his habit of letting his foot protrude past the lead screen when he was giving treatments. Another was forced to wear gloves when seeing patients because roentgen atrophy and its complications made his hands so unsightly.

Of course, there was an excuse for these men. The dangers of radiation were not appreciated at the time that they were exposed to these rays. Today, there is no excuse for occupational radiodermatitis. Unfortunately, we still see new cases in physicians who buy a fluoroscope machine without having a real understanding of the forces with which they are dealing.

Dr. Anthony C. Cipollaro explained the situation clearly when he said in his letter:

> Physicians are still developing radiodermatitis, I am sorry to say. In my opinion, this is due to gross negligence and carelessness on the part of the physician. There are physicians who do fluoroscopic examinations without proper protection against stray and direct radiations. There are surgeons who look for foreign bodies under a fluoroscope for prolonged periods of time without proper protection. There are surgeons who set broken bones under the fluoroscope. There are some physicians who use x-ray equipment without proper screening, and there are some physicians who handle radium, radon, thorium-X, and other radioactive agents without proper protection, and there are some dentists who still hold film in the mouth of the patient while taking radiographs.

To physicians who do these things, I can extend only sympathy.

Radiodermatitis is an easily prevented form of occupational disease. Also, it is the most serious cutaneous condition that is being discussed here today. Medical schools should stress constantly the fact that an x-ray machine is a dangerous piece of equipment and not merely a convenient diagnostic tool or a powerful therapeutic agent.

As pointed out by Lamb, r meter pencils can be worn giving an accurate estimation of the amount of radiation contacted by the physician.

While most contributors felt that radiodermatitis was on the wane, Dr. O'Leary reported that an average of three cases of radiodermatitis in physicians are still being seen at the Mayo Clinic per week. While many of these cases are due to exposure years ago, the problem is far from extinct.

INJURIES

Physicians, too, are subject to mechanical injuries incident to their occupation, and some of these are of dermatological interest. For instance, doctors in government service may acquire hyperkeratotic areas on their fingers due to "pushing pencils." Assisting at surgery may result in hematomas or cuts on the hands due to carelessly wielded instruments by hypertonic surgeons. Burns may develop as the result of faulty electrosurgical equipment or in unskillful application. Arnold feels that this may be beneficial in giving the operator a clearer understanding of the pain caused by electrodesiccation.

Another injury that is of interest to the dermatologist because it may occur in such specialists, is the very painful conjunctivitis that results from ultraviolet light when the eyes are not protected. However, this condition is seldom recurrent because one experience is sufficient to persuade all but the most stubborn to wear sunglasses when giving ultraviolet radiation.

COMMENT

It was agreed that professional dermatoses were less common in physicians than one would expect considering the hazards to which they are exposed. Except in the case of dermatitis due to detergents and gloves, cleanliness and care may explain a great deal of this comparative freedom. Also, acquired immunity due to exposure may be a reason for the low incidence of infections. It is probable that the general decrease in the incidence of syphilis and the acceptance of "quick" scrubbing agents will further decrease the occurrence of occupational eruptions in physicians.

A positive approach to this problem is taken at the University of Cincinnati. Lectures are given to the medical students on the prevention of dermatitis of their own hands. To quote Dr. Leon Goldman, "We emphasize the prevention of infection and irritation of the skin and show how easy it is to use clamps, cotton applicators, finger cots, and rubber gloves. In dermatology for examination of the infectious lesions, we use more tongue blades than our neighboring ENT service." Granting that medical curricula are crowded, there are few dermatological lectures that could be given that would be of more practical value to the student.

Another aspect worthy of consideration is, how good a patient is the doctor? As far as the dermatologist is

concerned, physician-patients leave something to be desired. Dr. W. M. Sams made the illuminating remark, "Physicians in my community suffer contact dermatitis from self-medication more frequently than they do from occupational exposure." Most dermatologists would agree with this.

Dr. Livingood pointed out that "I have found it necessary to hospitalize a fair number of these people in order to work out all of the etiologic factors because, for one thing, it is very difficult to obtain complete cooperation from physicians without hospitalization."

The average doctor in whom an eruption develops treats (or often overtreats) the condition himself. As a rule, he tends to change from one remedy to another in rapid succession because of failure to obtain immediate relief and because of personal doubt in his own diagnosis. Unfortunately, often these remedies consist of the detail-man's latest "miracle antibiotic," "nontoxic antihistaminic" or "omnipotent adrenal steroid." At times, the results are far from happy.

SUMMARY

1. Physicians are exposed to many irritating chemicals and infections in their professional routine.

2. Contact dermatitis is the commonest type of injury suffered, and among its more frequent causes may be listed scrubbing, gloves, local anesthetics, antiseptics, and antibiotics.

3. Psychosomatic influences may be important in such cases.

4. Infections are comparatively uncommon, but may be acquired accidentally from patients. A series of 27 cases of extragenital chancres in physicians was gathered during this survey.

5. Radiodermatitis is still occurring in physicians, but it is preventable and its occurrence is inexcusable.

6. Injuries are trivial and comparatively unimportant.

7. It is possible that physicians leave something to be desired as dermatological patients.

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TUBERCULOSIS IN MEDICAL STUDENTS AND NURSES

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The very significant decline in mortality from tuberculosis in recent years stands out as one of the major achievements in the field of public health. One of the most encouraging features of the present-day picture is the more rapid rate of decline which has prevailed since 1945. Provisional figures for 1950 indicate the death rate to be 15% below that of the previous year. During the past five years tuberculosis mortality has declined approximately 42%. Since this presentation deals with the problem of tuberculosis in young adults, we must not overlook the very favorable mortality experience of this particular age group. In 1948 the number of deaths in the age group 15 to 24 years was 26.2% below that of the previous year. This very significant improvement in tuberculosis mortality bears a very direct relationship to the marked decrease in prevalence of tuberculous infection. Extremely low levels of infection have been reached in some areas. Jordan [1] has conducted a most comprehensive program of tuberculosis case-finding in Minnesota over a period of 20 years. He reports that in 128 schools in which tuberculin was applied to the entire enrollment not a single child reacted to the test. The tuberculosis death rate in this area is less than half of the rate for the entire country. At the University of Pennsylvania, 48% of undergraduate freshmen were tuberculin reactors in 1931 as compared with 18% in 1950. This is a reduction of 62.5%. Durfee [2] reported that the prevalence of tuberculous infection among college students in all sections of the country has declined 54.8% during a period of 15 years. Continued progress in our ability to control tuberculous infection during the next 10 years may conceivably result in a tuberculosis death rate of 12 or below by 1960.

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Read in the Symposium on Occupational Health of Medical Personnel before the Section on Preventive and Industrial Medicine and Public Health at the One Hundredth Annual Session of the American Medical Association, Atlantic City, June 13, 1951.

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TUBERCULOSIS IN MEDICAL STUDENTS

At present there are many encouraging aspects in the problem of tuberculosis in medical students. Several schools have succeeded in practically eliminating tuberculosis as a health hazard among their students. This can be accomplished only when we are able to identify those phases of training which provide unduly high infection rates and then by providing effective barriers against these sources of infection. The tuberculin test has permitted us to establish quite definitely the time of primary infection by its use at rather frequent intervals. It has been the most valuable procedure available to us in studying the epidemiology of tuberculosis in medical and nursing personnel.

The University of Rochester Medical School has had a rather unique experience, and a most gratifying one, in dealing with tuberculosis among its students. In 1948 Meade [3] reported that a careful analysis was made of students converting to tuberculin during the period 1937-1943. It was found that in six classes there were 139 students who were nonreactors at the beginning of the second year. By the end of the year 80.5% had become reactors. This is indeed a high attack rate of primary tuberculous infection during the short period of nine months. The courses in pathology seemed to provide the most definite elements of risk. All students attended and assisted at autopsies on tuberculous subjects and handled and examined unfixed tissues. In 1943 a program was

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planned whereby all such contacts would be reduced to a minimum. Students were not permitted to attend autopsies on known cases of tuberculosis and fresh-tissue specimens were demonstrated by an instructor. Following the adoption of these measures the conversion rate among the next four classes dropped to 3.8%. Thus the incidence of primary tuberculous infection in second-year students was reduced 95%. How has this very effective means of controlling tuberculous infection in the student body influenced the more serious problem of students developing disease of the reinfection type? A recent communication from Dr. Ralph Jacox [4] of the University of Rochester is indeed very enlightening. He comments as follows:

We feel that the chief reason for our decreased incidence of tuberculous infection is related almost entirely to the adequate control measures instituted in 1943. During the pre-control years the number of cases of clinical tuberculosis which developed among the medical student body was alarming. As many as seven or eight individuals out of a class of fifty to sixty in some years would develop radiographic and clinical evidence of pulmonary tuberculous infection. Since 1946 no cases of tuberculosis have developed among the medical student body.

Dr. Jacox reports also that during the past three years all patients admitted to the hospital have received chest x-rays. Thus their medical students are given every possible protection during their preclinical and clinical years.

The University of Minnesota Medical School has also developed a very effective program of tuberculosis control. Dr. J. A. Myers [5] recently summed up their program at the University of Minnesota in the following statement:

Not many years ago an extremely serious tuberculosis problem existed among students of nursing and medicine at the University of Minnesota. In fact, as many as 4 to 10 per cent of students in medicine developed demonstrable tuberculous lesions before graduation. Every method of tuberculosis control, including the numerous so-called artificial immunizing agents, was given careful consideration. It was finally concluded that those who had treated tuberculosis as a contagious disease had the only method that had proved effective and offered future promise. Therefore, the program adopted at Minnesota consisted of protecting students against contagious cases of tuberculosis. This was done by (1) carefully examining for tuberculosis all patients upon admission to the hospitals; (2) requiring pre-employment examinations for all personnel and periodic examinations throughout periods of employment; (3) institution of contagious disease technique for all persons found to have contagious tuberculosis on admission to the hospitals and immediate removal or isolation of employees who developed this disease; (4) teaching students the importance of protecting themselves against contagion and also teaching them how to organize and direct contagious disease technique whether it be for an individual patient in a single room or an entire tuberculosis service. These precedures markedly decreased tuberculous infection among our students with corresponding reductions in morbidity and mortality. It has now been eight years since a student has fallen ill from tuberculosis while in school. Only one had a lesion large enough to be detected by x-ray film inspection. We have seen no reason for adopting BCG when the fundamental methods employed produced so much better results than any reported by the use of this living organism. We now consider our former students fortunate in that they did not receive any so-called immunizing agents consisting of living tubercle bacilli, including BCG.

In 1946 Morris [6] reported the results of a case-finding program among women medical students at the Woman's Medical College of Pennsylvania. This study covered a 12-year period during which time 449 students were under observation. During the first seven years, from 1932 through 1938, all students who entered as nonreactors to tuberculin converted before graduation. Fifty-six students developed tuberculous lesions, an incidence of 12.5%. Dr. Marion Boyd [7] has kindly provided me with complete data covering the experience at Woman's Medical College during the past five years. Of 50 students entering in 1950, only 18% reacted to tuberculin. From 1946 to the present time three students have developed pulmonary tuberculosis. During the past five years, therefore, the incidence of tuberculosis was approximately 85% below that of the period 1932-1943. Control measures believed to be largely responsible for this improvement are those which have been directed toward various phases of instruction in pathology. Students are not permitted to attend necropsies on tuberculous subjects and the pathologists use all possible precautions in demonstrating tissues in the laboratory.

At the University of Pennsylvania the control of tuberculosis among our students has presented a rather complex problem. Until recent years, almost all students who entered as nonreactors to tuberculin converted during their four years of training. The conversion rate was significantly higher among second-year students than in students of other classes. During this earlier period it was common practice to use advanced, open cases of tuberculosis for teaching purposes in classes in physical diagnosis for second year students. This has been discontinued. The department of pathology has cooperated by improving autopsy room techniques and by limiting the number of necropsies on tuberculous subjects which are attended by students. Three years after the adoption of this program 60% of nonreactors at entrance graduated without becoming tuberculin reactors. The incidence of pulmonary tuberculosis has decreased quite markedly. During the five-year period 1935-1940, pulmonary lesions developed in 40 students while in school. In the last five years the disease has developed in nine students with no new cases having been detected during the past two years. In our experience the development of tuberculous disease has been much more frequent among students entering medical school as reactors to tuberculin than among those who were nonreactors. Of 69 students who acquired significant lesions while in medical school, 51 (73.9%) reacted to tuberculin at the time of their entrance physical examination.

In view of the fact that tuberculosis ranked as a major health hazard among students at the above-mentioned medical schools, it is of interest to note that at Tufts College Medical School the disease has not been a serious problem. Dr. Dwight O'Hara,[8] Dean of the School, informs me that during the past 10 years tuberculosis has developed in only two students during their medical training. A report by Seifer [9] of the same institution indicates that students rarely have contact with tuberculosis either in the clinical phases of their instruction or in the autopsy room.

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TUBERCULOSIS AMONG NURSES

Tuberculosis among nurses has presented a problem of real magnitude, especially in large general hospitals which maintain tuberculosis wards. Israel, Hetherington, and Ord [10] reported that at the Philadelphia General Hospital 48% of nurses who were nonreactors on admission to training became reactors during the first four months, and all converted before the end of the third year. Myers, Boynton, and Diehl [11] observed a conversion rate of 100% in nurses at a Minneapolis hospital having a tuberculosis service. Following the discontinuance of this service the percentage of conversions declined very sharply. In one class, not a single nurse acquired primary infection during three years of training. They call attention to the possible dangers of infection to nurses through exposure to a case of tuberculosis over a limited period of time. A patient with far-advanced pulmonary tuberculosis was in the hospital for 10 days, this being the only known admission at that time. Of 11 nonreactor nurses assigned to the care of this patient, 10 were found to be reactors three months later.

Numerous reports have been published since 1930 showing the incidence of tuberculous disease among nurses to be from 5 to 10%. Shipman and Davis [12] reported that in 6.7% of nurses at the University of California Hospital, pulmonary tuberculosis developed. At the Philadelphia General Hospital, which provides 396 beds for tuberculous patients, Israel [10] observed 637 nurses through three years of training in 68 of whom (10.6%) tuberculosis developed. Since 1946, the incidence of the disease has been reduced by more than 50%. Much more rigid contagious disease techniques have been put into practice and BCG vaccine has been employed on a voluntary basis. Nonreactors are not permitted to go on duty in the tuberculosis pavilion. Dr. David A. Cooper [13] who is in charge of the program reports that in two nurses who received BCG vaccine tuberculous lesions have developed. He states that the lesions were extremely minimal in extent, there was no tendency toward progression and clearing took place in a relatively short time. Kinney [14] reported that in two nurses tuberculosis developed two years after vaccination with BCG. In each case the disease developed shortly after service on a tuberculosis ward, indicating a presumably short incubation period of from four to six weeks. The onset was acute and explosive in each instance, although the clinical course of the disease was relatively benign and of short duration. Involvement of hilar and other lymph nodes was a main feature.

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16. Medlar, E. M.: Prophylactic (BCG) Vaccination to Control Tuberculosis, J. A. M. A. **141**: 593 (Oct. 29) 1949.
17. de Abreu, M.: Early Diagnosis and Treatment in Tuberculosis Prophylaxis, Dis. Chest **19**: 249, 1951.
18. The Present Status of Vaccination in Tuberculosis Control Program: A Report of the Council on the Management and Treatment of Diseases of the Chest, American College of Chest Physicians, Dis. Chest. **19**: 110, 1951.

The control of tuberculosis in nurses can be achieved only through the utmost cooperation on the part of the hospital administration, supervising nurses, and nurses in training. All concerned must have an intelligent and sympathetic understanding of the risks involved. Nurses assigned to duty on tuberculosis wards are subject to a very definite risk of infection unless the most detailed and effective contagious techniques are maintained continuously. Education of the nurse through lectures and demonstrations is an essential part of the program. Chest x-rays on all adults admitted to the hospital should be a routine procedure, as a means of protecting nurses from unsuspected sources of infection. Close medical supervision should be provided for the nurse throughout her entire period of training. The tuberculin test should be applied during her first week in the hospital, and nonreactors should be retested at intervals of four months. Chest x-rays should be given all nurses at entrance and to all tuberculin reactors at least twice annually.

VALUE OF BCG VACCINE

Since the value of BCG vaccine has not as yet been clearly established, various committees and medical groups have recommended that its use be limited to medical and hospital personnel who may have repeated exposure to tuberculosis. It is suggested, also, that the vaccine should not be released for use among the general public. Present methods of preparation of BCG vaccine leave much to be desired. Dubos [15] has found that the numbers of viable organisms injected as an immunizing dose vary many thousandfold under the conditions of present-day practice. The early experimental work in cattle, confirmed quite recently by Medlar,[16] indicates that vaccinated animals are no more resistant to later infection with virulent tubercle bacilli than are the unvaccinated. De Abreu [17] recently reported that in Rio de Janeiro there was a substantial increase in the tuberculosis mortality rate among infants and young children in spite of extensive use of BCG. During the period 1945-1948, the mortality rate among children from 1 to 2 years of age increased 62.5%. During the same period, the tuberculosis death rate for all ages showed a significant decrease and especially so in the age group 20 to 40 years. The Council on the Management and Treatment of Diseases of the Chest [18] of the American College of Chest Physicians issued in January, 1951, a report on "The Present Status of Vaccination in Tuberculosis Control Programs." They say in part:

> It must be stated that there is no evidence that meets strict scientific requirements demonstrating that BCG effects the control of tuberculosis, despite the suggestive results of a few studies. Because there is no general agreement among investigators anywhere in the world on such fundamental matters as the preparation of the vaccine, the method of vaccination, what constitutes a successful vaccination, how resulting immunity may be measured or how long such immunity lasts, the procedure would seem to be still in the investigational period.

We know that primary infection with virulent tubercle bacilli does not confer a high degree of immunity against subsequent infection and disease. It is unreasonable to expect, therefore, that attenuated organisms may be more effective as an immunizing agent. The control of tuberculosis among medical students and nurses presents a for-

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midable problem wherever they may have repeated contacts with patients having the disease in a communicable form. Vaccination with BCG should under no circumstances be employed as a substitute for those measures which have proved so effective in preventing infection with tubercle bacilli.

University of Pennsylvania.

CLINICAL NOTES

TREATMENT OF MENINGITIS BY INTRACISTERNAL INJECTION OF CHLORAMPHENICOL

Olavo Trindade, M.D.
and
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In 1947, Ehrlich and collaborators [1] isolated Streptomyces venezuelae, N. sp., from a soil sample obtained near Caracas, Venezuela. Filtrates of S. venezuelae cultures were found to have marked antibiotic activity against several gram-negative bacteria, principally Shigella paradysenteriae (Sonne). This new antibiotic in crystalline form is a neutral compound, is stable in aqueous solution for over 24 hours at a pH 2 to 9, and in distilled water is unaffected by boiling for 5 hours. At 25 C its solubility in water is about 2.5 mg. per milliliter. It is very soluble in propylene glycol, butanol, ethanol, acetone, and ethyl acetate. In vitro tests against gram-negative organisms demonstrated the new antibiotic to be 7 to 36 times as active as penicillin and approximately 2 to 16 times as active as streptomycin. Against Mycobacterium tuberculosis, it is approximately one-tenth as active as streptomycin.[2] The drug showed remarkable tuberculostatic action [3] against the majority of 19 human-type strains studied in concentrations of between 6.25 and 12.5 γ per milliliter in the presence of serum. One bovine strain was equally sensitive. Payne and co-workers [4] first employed the drug in the treatment of 16 patients with epidemic typhus. They administered it by oral and intravenous routes.

Chloramphenicol (chloromycetin*) is the chemical synthetic form of the antibiotic, and it has the same physical and chemical properties as the product obtained by fermentation.[5] It is rapidly absorbed, inactivated, and excreted.[6] In man, the drug is excreted largely in the urine, principally in the form of inactive products. After oral administration, a single dose of the drug produces an evident blood level within 30 minutes. At the end of eight hours it has disappeared from the blood, and about 90% of the total amount administered is received in the 24-hour urine specimen. The distribution of the antibiotic in the tissues of a dog is not uniform; there are high concentrations in the liver and kidneys and smaller amounts in the brain and spinal fluids. Clinically, the drug has been shown effective in the treatment of patients with rickettsial diseases, typhoid, and brucellosis, evidencing low toxicity for human beings.[7]

The case reported here is interesting not only because it concerns an uncommon disease—meningitis due to Shigella paradysenteriae—but also because it suggests another route for the administration of chloramphenicol to humans. Prior to this case, the antibiotic had been given only orally and intravenously, and only the oral route had been recommended.

REPORT OF CASE

History.—The patient was a white man, aged 22, who had been ill for three days prior to admission. He complained of headache and had an axillary temperature at times reaching 105.8 F. He was admitted to the emergency section on Feb. 6, 1950, with complaint of pain low over the right side the day before, followed by nausea and vomiting. He felt hot and dizzy and had headache and blurred vision.

Physical Examination.—The patient's axillary temperature was 101 F, rectal temperature was 103 F, pulse rate 140, respiratory rate 24, and blood pressure 90 systolic and 65 diastolic. His weight was 70 kg. Examination of the head of the respiratory and circulatory systems showed nothing unusual. Gentle palpation revealed muscle rigidity in the right lower quadrant of the abdomen, and deep palpation caused sharp pain.

Hospital Course.—A diagnosis of acute appendicitis was made. With the patient under spinal anesthesia (3 cc. of 5% procaine hydrochloride solution) immediate appendectomy was performed through a McBurney incision. A phlegmonous appendix was found, which was ruptured during the operation. The peritoneal cavity was drained for two days. The cerebrospinal fluid obtained by lumbar puncture was clear. After the appendectomy the patient was given sulfacetamide intravenously, 1 gm. every six hours, penicillin intramuscularly, at first 50,000 units and afterward 100,000 units every three hours, and adequate amounts of fluids and vitamins.

In the afternoon after the operation, the patient's temperature rose abruptly to 104 F, and his condition was poor. His blood pressure was 130/70 and pulse rate 140. He had a headache, slight nuchal rigidity, and obnubilation. Convulsions occurred frequently, and establishment of an airway was necessary. Streptomycin was given intramuscularly, 0.25 gm. every six hours. The next day the patient's condition was worse. The severity of his headache increased, nuchal rigidity was still present, and photophobia developed. Kernig's and Brudzinski's signs could be elicited. Intracisternal puncture yielded grossly cloudy fluid, under marked pressure and spurting from the needle. The cell count was 9,333 leucocytes per cubic millimeter, all polynuclears. Glucose content was 65 mg. per 100 cc. Direct smear demonstrated gram-negative bacilli. Cisternal fluid culture was required. At this time an injection of 50,000 units of penicillin was given cisternally. The administration of sulfacetamide was discontinued, and peroral administration of sulfadiazine was begun.

On the third day lumbar puncture revealed turbid fluid, and the patient was immediately given 50,000 units of penicillin intrathecally. On the fourth day there was still no improvement in the patient's general condition. The temperature still rose as high as 104 F, and the same meningitic signs became more

From the Department of Surgery of the Clinic Hospital and of the University of São Paulo School of Medicine; Dr. Trindade, senior assistant in surgery, and Dr. Nastari, junior assistant in surgery.

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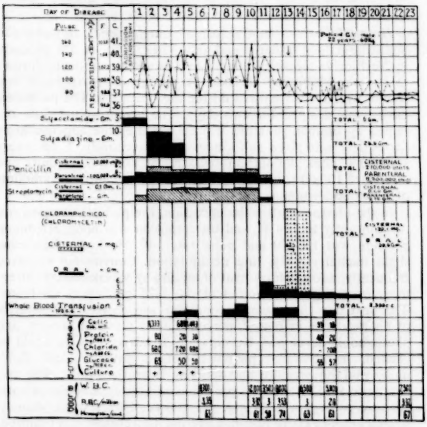
intense as the patient became stuporous. Slight cyanosis was present. In contrast to the exacerbation of the symptoms, the cisternal fluid that day contained only 688 cells per cubic millimeter, 80% of which were neutrophil leucocytes. The patient was given 20,000 units of penicillin and 0.1 gm. of streptomycin cisternally. Sulfadiazine therapy was stopped, and he was given increased fluids and vitamins and a blood transfusion. On the fifth day the cisternal fluid contained 1,493 cells, 85% of which were neutrophil leucocytes. He was given cisternally 20,000 units of penicillin and 0.1 gm. of streptomycin.

By the sixth day, in spite of the medication, the patient's general condition was growing worse; stupor increased, the temperature maintained a high level, and the cisternal fluid remained turbid. The patient received cisternally 25,000 units of penicillin and 0.1 gm. of streptomycin. On the following day his condition was almost unchanged. He was delirious at times. The cisternal fluid was still cloudy. He was again given 25,000 units of penicillin and 0.1 gm. of streptomycin by cisternal route. The next day the axillary temperature rose to 105.8 F. The patient was extremely restless and not aware of his surroundings. Cisternal puncture revealed cloudy fluid. He was given cisternally 30,000 units of penicillin and 0.1 gm. of streptomycin. The patient's general condition was still unchanged on the 11th day. His



Summary of clinical data in case reported.

temperature remained high: 104 F. Cisternal fluid continued to appear dull. He was given cisternal injection of a mixture of 25,000 units of penicillin and 0.1 gm. of streptomycin. At this time the culture of the first cisternal fluid specimen, which had been obtained the second day of the disease, revealed that the causative agent was S. paradysenteriae; therefore, treatment by penicillin and streptomycin was discontinued and oral administration of chloramphenicol was begun. The inital "loading" dose of 3 gm. was divided and given in two doses one hour apart. These were followed by additional doses of 0.25 gm. every two hours for three days, then every three hours for three days, and, finally, every four hours for two days. By the 18th day the patient had received orally a total amount of 20.5 gm. over an eight-day period.

On the 12th day, however, there was little clinical improvement. The temperature had decreased to 103 F, but cisternal fluid remained turbid. Considering the low cerebrospinal levels obtained orally,[8] Dr. Trindade thought of introducing the drug directly into the cisternal fluid to obtain higher concentration levels with total utilization of the antibiotic. A solution was prepared by diluting 0.25 gm. of chloramphenicol and 200,000 units of penicillin in 10 cc. of saline solution. A dose of 1.25 cc. was injected, containing about 3.1 mg. of chloramphenicol. There was no untoward reaction.

The next day, the patient evidenced some relief from headache, but the general condition and symptoms remained unaltered, and the temperature did not decline from 100.4 F. Although the chloramphenicol-penicillin preparation had been kept under refrigeration overnight, it showed crystallized sediment and therefore had to be discarded. Cisternal fluid obtained by puncture was still as dull as on all the previous daily samples. Since the infection persisted in spite of the therapy used, it was decided to increase the cisternal amount of the drug. A new suspension-solution was prepared by suspending 0.25 gm. of chloramphenicol in 20 cc. of isotonic sodium chloride solution, and a dose of 5 cc. was administered cisternally. The chloramphenicol content of this dose was 62.5 mg. or approximately 1 mg. per kilogram of body weight (the patient weighed 60 kg.). The injection was made slowly and cautiously by barbotage, and the portion of the drug in suspension was dissolved in the cisternal fluid.[9]

On the 14th day, 24 hours after this treatment, the patient showed marked improvement. His temperature decreased to 98.2 F. His pulse rate was 88, blood pressure 100/65. The headache and photophobia had disappeared, and nuchal rigidity had lessened. The patient regained consciousness and was able to answer all the questions clearly. Immediate cisternal puncture yielded crystal-clear fluid and normal pressure. The dose of 62.5 mg. was repeated. The patient continued to improve the following day. He was conscious, afebrile, and euphoric. The cisternal fluid was clear and slightly xanthochromic. It contained 53 cells per cubic millimeter, 65% of which were lymphocytes. By the next day the cisternal fluid was still clear, containing only 16 cells per cubic millimeter, 75% of which were lymphocytes. The fever did not recur, and the patient's condition continued to improve gradually, the nuchal rigidity decreasing every day, until he could again move his head and sit up in bed. When oral administration of chloramphenicol was discontinued, on the 18th day, the patient had received a total amount of 20.5 gm. perorally and 128.1 mg. cisternally.

On the 22nd day Widal and Weil-Felix tests were negative. Liver function tests indicated unchanged function of the hepatic cell. Blood, urine, and stool examination and culture proved negative for S. paradysenteriae. The cisternal fluid was clear and colorless, having 20 cells per cubic millimeter, all mononuclears. No blood culture was made during the acute phase of the disease. The patient was discharged on the 37th day, fully recovered, without neurological sequelae.

Follow-up Observations.—When examined, two weeks after discharge, the patient was in good condition. Cisternal puncture showed clear fluid, 16 cells per cubic millimeter (mononuclear leucocytes), protein 15 mg. per 100 cc., chlorides 680 mg., and glucose 71 mg. per 100 cc. There were no bacteria, either on direct smear or on culture. On reexamination, three months after cisternal chloramphenicol therapy, the patient had gained weight and was in excellent health. The cisternal fluid was clear and had only one cell per cubic millimeter. Protein was 10 mg. per 100 cc., chlorides 710 mg., and glucose 71 mg. per 100 cc. There were no bacteria, either on direct examination or on culture.

COMMENT

Acute Shigella paradysenteriae meningitis was observed in a patient after appendectomy under spinal anesthesia. It was perhaps due to complications of contamination at the time of puncture or to simultaneous bacteremia or septicemia; unfortunately, no blood culture was made during the acute period of the disease.

Sodré, Croce, and Cunha [8] have competently reviewed the literature on septicemia caused by S. paradysenteriae, which includes 150 cases between 1901 and 1949. We have reviewed the available literature on meningitis of the same origin and believe the present case to be the first ever reported. In spite of normal spinal fluid glucose levels, the case may be classed as severe from the standpoint of temperature and general condition.[9]

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Although the patient had been properly treated with penicillin, streptomycin, and sulfonamides, and although chloramphenicol had been given orally for two days together with a small injection of 3.1 mg. cisternally, no evident improvement could be observed after a period of 12 days. At this time a "loading" dose of 62.5 mg. of chloramphenicol was administered intracisternally with excellent results. Indeed, 24 hours after this administration the clinical picture was completely changed, the patient being almost cured.

In our experiments [10] dogs received cisternal doses of 2 mg., 5 mg., and 10 mg. per kilogram of body weight. These animals tolerated the administration and recovered spontaneously. Dogs inoculated intracisternally with S. paradysenteriae did manifest meningitis clinically but recovered spontaneously; the cisternal fluid was turbid 24 hours after inoculation, with increased pressure, but culture was negative. In vitro test cultures of S. paradysenteriae grow well in the spinal fluid of the dog but poorly in its serum.

Tuberculostatic levels of the drug [a] can easily be obtained in the spinal fluid by cisternal or intrathecal routes, which suggests its use in the treatment of the tuberculous meningitis. Further clinical studies will afford a more accurate appraisal of its value. To our knowledge there has been no previous report on therapy with chloramphenicol by cisternal or intrathecal routes.

SUMMARY

A patient with severe Shigella paradysenteriae meningitis following spinal anesthesia recovered fully with chloramphenicol (chloromycetin*) therapy. A new route was successfully used, and recovery is attributed principally to the intracisternal administration. The dosage employed was 1 mg. of the drug per kilogram of body weight. We recommend the intracisternal route of administration because the antibiotic can be easily sterilized by boiling and possesses low toxicity.

Rua da Moóca, 3,375 (Dr. Trindade).

10. Trindade, O., and Nastari, F.: Intracisternal Chloramphenicol in Dog: Studies on Experimental Meningitis, to be published.

Appendectomy During Cholecystectomy.—The appendix should be examined routinely before a cholecystectomy is performed, even though a definite pathologic condition exists in the gallbladder, for studies have shown frequent coexistence of appendical lesions. The examination should be done with care, because an inflammation of the appendix, especially of the catarrhal type, can be easily overlooked if the inspection is cursory and the surgeon's mind is centered on the gallbladder pathology.

The fact that the appendix may produce trouble subsequently if allowed to remain, and that it can be removed during cholecystectomy with little added risk, indicates that it should be removed routinely whenever it is accessible. If the cholecystectomy incision does not permit the appendectomy, the organ should be carefully examined by palpation for the presence of a fecalith or any abnormality. If a fecalith is found, it is advisable to remove the appendix by extending the gallbladder incision or by making a separate McBurney or gridiron incision. An elective appendectomy may be necessary at a future date, if the condition of the patient does not permit an immediate appendectomy.—Tokuso Taniguchi, M.D., and Frederick A. Stratton, M.D., Prophylactic Appendectomy During Cholecystectomy, *Wisconsin Medical Journal*, October, 1951.

AN EARLY CLINICAL SIGN OF VENOUS THROMBOSIS

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Venous thrombosis, with its insidious onset and disabling, if not tragic, complications, is receiving more attention than ever by surgeons, internists, and obstetricians. As medical science conquers more and more of the traditional foes of mankind, it becomes only natural that intravascular clotting command and receive more attention. Furthermore, with the ever-increasing elective invasion of heretofore unexplored surgical fields, the problem of postoperative venous thrombosis becomes even greater.

Whether or not venous thrombosis is actually on the increase, the medical profession has become more conscious of the problem, so that routine postoperative examination of the lower extremities is a daily function of all surgical residents and surgeons, and should be for obstetricians and internists as well, especially in the elderly bedridden patients.

Much of the difficulty in the management of thromboembolism is due to the fact that diagnosis is frequently not established until serious embolic manifestations have arisen. Recently Dr. Kay, working in the Ochsner laboratory, reported that thrombosis was favored by a lowering in the antithrombin content of the plasma and that this lowering could be successfully combated with alpha tocopherol and calcium. Unfortunately, this test has not had sufficient trial to be confirmed or refuted by other investigators. My experience in more than a year has not justified the initial confidence in the test, but final approval or condemnation of the test will be deferred, pending further studies.

In the absence of any truly reliable and practical laboratory test, the early diagnosis of venous thrombosis depends on clinical judgment and acumen. The following important diagnostic signs and symptoms of thromboembolism (the two processes are so closely interrelated that they may be considered as one syndrome) are generally described in the literature: (1) pain with or without tenderness over the calf muscles, malleoli, or plantar surfaces; (2) pain on dorsiflexion of the foot with leg extended (Homan's sign); (3) swelling of the leg; (4) unexplained rise in pulse or temperature; (5) chest pain, with or without cough or bloody expectoration; (6) apprehension, pallor, nervousness, or a "feeling of impending disaster"; (7) cyanosis of the legs; (8) temperature differences in the legs; and (9) the sentinel veins of Pratt.

To these I should like to add a fairly constant, simple, and early sign that I have found to be of great value in my clinical practice. In the past five years, I have become increasingly aware, particularly on palpating the femoral pulse preparatory to vein ligation, of the significance of marked diminution or even absence of the femoral pulse in the affected extremity. This phenomenon has invariably been present, even in the absence of other appre-

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ciable signs or symptoms, and has served as a useful guide to therapeutic unilateral femoral vein ligation followed by anticoagulant (heparin) therapy, my present method of management of these cases. For example, in the past six months I have had two cases of serious but nonfatal pulmonary emboli in which this unilateral change in the femoral pulse was the only significant clue to the affected extremity.

The physiological mechanism for the sign may be understood when one considers the marked and early angiospasm that attends all vascular accidents to any extremity, regardless of the location of the thrombus. The degree and significance of this angiospasm is readily appreciated by anyone who has successfully performed a lumbar sympathetic block on a patient with venous thrombosis.

The change in the femoral pulse occurs early in both thrombophlebitis and phlebothrombosis, long before there is any demonstrable edema or swelling. This sign has the additional advantage of being apparent without the aid of any apparatus. Observation of the femoral pulse should be part of the daily postoperative routine, so that appropriate therapeutic measures may be taken when indicated.

SUMMARY

A simple bedside test of diminution or absence of the femoral pulse in the lower extremities is reported as another diagnostic aid in the early detection of venous thrombosis.

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FATAL AIR EMBOLISM IN PREGNANCY

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Air embolism is not an uncommon complication when diagnostic or therapeutic measures using air under pressure are employed. Air embolism also occurs when the air is not under pressure. In either instance there must be a break in the continuity of a vessel, either artery or vein, and the open vessel must contain blood under less pressure than the surrounding air. Of particular interest and concern to the obstetrician are those situations involving the female genital tract that may give rise to air embolism during or shortly following pregnancy.

From the Department of Obstetrics and Gynecology, Baylor University College of Medicine, and Jefferson Davis Hospital.

1. Forbes, G.: Air Embolism as Complication of Vaginal Douching in Pregnancy, Brit. M. J. **2**: 529-531 (Oct. 21) 1944.
2. Deadman, W. J.: Fatal Air Embolism: Case Reports, Canad. M. A. J. **37**: 157-160 (Aug.) 1937.
3. Breyfogle, H. S.: Death From Air Embolism Following Insufflation During Pregnancy: Report of Case, J. A. M. A. **129**: 342-344 (Sept. 29) 1945; Correction **129**: 643 (Oct. 27) 1945. Partridge, A. J.: Third Case of Fatal Air Embolism Reported After Vaginal Insufflation, Brit. M. J. **2**: 329 (Sept. 11) 1943.
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5. Osborn, G. R., and Dawson, J. C. C.: Air Embolism, with Reports of 3 Cases, Lancet **2**: 770-772 (Oct. 1) 1938.
6. Mylks, G. W., Jr.; Brown, A. B., and Robinson, C. N.: Air Embolism During Labour, Canad. M. A. J. **56**: 427-429 (April) 1947.

Forbes [1] reported the case of a woman dying suddenly at three months pregnancy apparently after a self-administered douche. Autopsy revealed the right side of the heart and the pulmonary artery to be filled with frothy blood. Deadman [2] reported four cases of fatal air embolism in women anywhere from three and one-half to seven months pregnant. In three of these a Higginson syringe had been used to inject fluid to induce abortion. Air was inadvertently injected along with the fluid. Fatal air embolism following attempts at abortion, in which trapped air is forced into the uterus along with various other materials, is not rare; there are many reported instances. Also, fatalities have resulted from air embolism following vaginal insufflations during pregnancy.[3] Patients have died from air embolism as a result of assuming the knee-chest position as part of their postpartum exercises.[4]

As a complication of delivery, fatal air embolism has been considerably rarer, judging from the relatively few reports in the literature. Osborn and Dawson [5] reported two such fatalities in 1938. The first was in a primigravida on whom a cesarean section was done for dystocia. During the operation the patient's blood suddenly became dark, and a general cyanosis was apparent. The uterus did not respond well to oxytocics, and there was considerable hemorrhage. One-half hour after the operation she became quite cyanotic, cried and waved her arms about. She died three hours after the operation. Autopsy showed air bubbles in the right side of the heart. The placental site was left anterior at the fundus. The second fatality, a primigravida, died mysteriously one hour after a normal spontaneous delivery. Shortly before death, when a nurse expressed some clots, the patient collapsed, became restless and cyanosed, and waved her arms about. Autopsy revealed many air bubbles in the right auricle and ventricle and in the pulmonary artery. In 1947 Mylks, Brown, and Robinson [6] reported a patient who hemorrhaged during labor from a low-implanted placenta with separation. One-and-a-half hours before delivery she went into shock, became restless, and was cyanosed. She died one-half hour after delivery of a stillborn baby. At autopsy air bubbles escaped when the vessels of the breast were cut. Air bubbles were also in the right ventricle.

REPORT OF CASE

History.—P. M., a 42-year-old woman, gravida 3, para 2, had been regular in her attendance at the clinic, and her prenatal course was uneventful except for development of polyhydramnion, noted on Dec. 2, 1950. Fetography showed one fetus in breech presentation, with no fetal abnormalities apparent. The expected date of confinement was Jan. 27, 1951. The patient was first admitted to the hospital on Jan. 11, 1951, because of suspected ruptured membranes. After a four-day hospital stay, during which time she received penicillin, she was discharged with no further evidence that the membranes were actually ruptured. The patient was next admitted to the hospital on January 30 because of the onset of labor.

Physical Examination.—There was a generalized urticarial rash over the entire body, which had been present for about three days according to the history. Bright red blood was present on the perineum, but no active bleeding was noted at this time. The size of the uterus was compatible with a gestation of approximately 34 weeks. The fetus was thought to be in a transverse presentation. Fetal heart tones were not audible. The blood pressure was 120/75, pulse rate 120, and temperature 99.8 F. During fetography an episode of vaginal bleeding occurred (about 200 cc. of bright red blood). The roentgenogram revealed a complete

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right sacrotransverse breech presentation. Speculum examination revealed placental tissue to be covering the entire internal os. The patient was taken to the operating room, where the diagnosis of placenta previa was confirmed by an attending staff member. The cervix was dilated 6 cm.

Hospital Course.—A transverse, low-flap cesarean section was done under cyclopropane, ether, and nitrous oxide anesthesia without incident, and a stillborn fetus weighing 2,120 gm. was delivered. The placenta completely covered the internal os and extended up anteriorly and to the right. The patient's general condition was good immediately after the operation. At this time the blood pressure was 130/80 and the pulse rate 120. Twenty minutes later the blood pressure had dropped to 80/60, and the pulse rate had risen to 144. Ten minutes later the blood pressure was 75/40. There was no definite evidence of intra-abdominal hemorrhage and no unusual external bleeding. The abdomen was soft, and the uterus felt firm. The lungs were clear. The urticarial rash seemed to become larger and more diffuse. Shock therapy, including oxygen, morphine, and rapid blood transfusion, was being carried out. The patient became very dyspneic after the onset of shock and did not respond to medication. She became markedly cyanotic; respirations became more labored; and she died 65 minutes after operation.

Laboratory Data.—The patient's blood type was O, Rh positive. On admission the hemoglobin value was 16 gm. per 100 cc. Findings from urinalysis were essentially negative. Repeat blood typings and cross-matchings after death revealed no error.

Autopsy Findings.—Autopsy was performed eight hours after death. When the pulmonary artery was opened in situ, air bubbled out freely and was apparently under some pressure. The right auricle and ventricle contained frothy blood. The peritoneal cavity contained approximately 300 cc. of dark blood. The uterus was firm and measured 15 x 15 x 10 cm. The incision was in good apposition, all sutures being in place. One small blood clot was in the right cornu of the uterus. Open vessels could not be demonstrated on the inner surface of the uterus. Microscopic examination revealed no further information.

COMMENT

It appears that under certain conditions the pregnant uterus is peculiarly adapted to becoming an entrance for air. The entrance is usually through one or more open vessels subjacent to the separated or partly separated placenta. Entrance may also be created during operative procedures such as cesarean section, by cutting across vessels in the uterine wall. When a cesarean section is done in the presence of uterine bleeding, when there has been separation of the placenta, one may expect the chances for air embolism to be enhanced somewhat. Air embolism as a complication of delivery probably occurs oftener than is generally supposed, and is undoubtedly the cause of some unexplained maternal deaths.

In patients dying of air embolism marked cyanosis is almost invariably present unless death is instantaneous. This anoxia, the probable cause of death, would seem to be brought about principally by two mechanisms. First, the heart fills with compressible air. Thus, with each heart beat much of the force of the beat is taken up in compressing the air rather than forcing a normal amount of blood through the vessels. Second, the blood is whipped into a froth, and reaches the lungs as such, preventing a normal exchange of gases. It is, of course, possible for some air bubbles to get through the capillary bed into the general circulation; or air might, on occasions, be shunted into the general circulation before reaching the lungs. If bubbles reach the vessels of the brain, heart, kidneys, or other organs, one could expect various symptoms characteristic of the organ or organs involved.

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COUNCIL ON PHARMACY AND CHEMISTRY

REPORT TO THE COUNCIL

The Council has authorized publication of the following report. R. T. STORMONT, M.D., *Secretary.*

A CONTROLLED STUDY OF PAIN RELIEF BY INTRAVENOUS PROCAINE

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Genesio L. D'Alessandro, M.D.
and
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Since 1947, almost 50 publications have appeared which report that many varieties of pain as well as edema, muscle spasm, itching, symptoms of asthma, and certain eye diseases have been relieved by intravenous procaine. Most observers have reported that the side-actions are minimal and of little consequence. Despite the necessity of controls in investigations of this type, no observer (known to the authors) in studying the beneficial effects of this drug has treated a comparable group either with a placebo or with a standard therapeutic agent. Both kinds of comparison are essential. In addition, the known rapid hydrolysis of procaine in the blood stream [1] and the slight or absent analgesic effects of its break-down products [2] (paraaminobenzoic acid and diethylamino ethanol) are not in accord with the prolonged pain relief reported. For these reasons, a controlled study of pain relief by intravenous procaine was undertaken.

METHOD

The method of study is that previously used by the authors to estimate the analgesic power of barbiturates.[3] Patients who had undergone major surgical procedures and who developed constantly present wound pain of moderate or severe degree on the first postoperative day were the subjects of this study. Any patient with a history suggestive of procaine sensitivity was not included in the study. When a suitable degree of pain developed, the patient was given the first drug of a series (saline, procaine, morphine) and the degree of pain relief evaluated at specific intervals thereafter (usually 30 and 60 minutes). If little or insufficient relief was obtained, the second drug was given and its effect again evaluated after specific intervals. The third drug was given and evaluated similarly. If pain relief was obtained after any dose, the subject was observed at intervals until his pain returned to approximately the original level and then the series of drug administrations continued as described. Not every subject received all three drugs, because, in many, pain did not return within the experimental period (8:00 a. m. to 6:00 p. m. of the first postoperative day). In others, the pain which returned was milder or of different type and could not be used for further testing.

The three drugs employed were saline, procaine hydrochloride, and morphine sulfate. Procaine was given as a 0.1% solution in 5% dextrose in water through an intravenous infusion set. The doses used will be discussed below. Saline was given in a similar manner at a rate of approximately 200 cc. per hour. Intravenous morphine was given slowly by syringe over the

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This work was carried out under grants from the National Research Council, No. D-1, and from the Department of the Army, No. 49-007-MD-76.

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course of one minute. The dosage was always 8 mg. per 70 kg. of body weight. A physician was present constantly during the administration of the drugs and recorded the side-actions. All evaluations of pain relief were made by trained technicians who were unaware of the nature or dose of the drug administered. The technicians appeared only at the specific times for evaluation and were not present during the entire drug administration. Criteria for evaluation were established rigidly and all technicians were indoctrinated with the same standards.

Drug effects were judged by their ability to produce both pain relief and comfort. In previous work with analgesics, it was observed that pain relief was not always associated with comfort; that is, satisfaction by the patient with the results produced. Some patients, while claiming to be relieved of their pain, were not content because they continued to be tense, restless, and bothered by tubes, catheters, or nausea. Others, although claiming that their pain was unchanged, appeared comfortable as a result of the drug and did not wish further medication. The authors believe that analgesics are therapeutically effective when they provide comfort with or without pain relief, and have evaluated the efficacy of any single dose in terms of the four possible categories: (*a*) no comfort, no pain relief; (*b*) no comfort, pain relief; (*c*) comfort, no pain relief, and (*d*) comfort, pain relief. The latter two categories represented the desired effect both from the physician's and the patient's viewpoint. Further justification for these categories as well as further details of the method can be found elsewhere.[3]

TABLE 1.—*Therapeutic Effectiveness of Intravenous Saline, Procaine, and Morphine in Small Groups of Patients*

Time of Evaluation		Saline		Procaine		Morphine
		30 Min.	60 Min.	30 Min.	60 Min.	30 Min.
Group I (12 Patients)						
0 Comfort	0 Relief	7	..	5	..	4
0 Comfort	+ Relief	1	..	2	..	..
+ Comfort	0 Relief	..	..	..	..	1
+ Comfort	+ Relief	4	..	4	..	5
Group II (16 Patients)						
0 Comfort	0 Relief	14	13	7	6	..
0 Comfort	+ Relief	..	1	1	2	2
+ Comfort	0 Relief	..	..	..	2	..
+ Comfort	+ Relief	2	2	6	2	10
Group III (15 Patients)						
0 Comfort	0 Relief	4	5	6	6	..
0 Comfort	+ Relief	1	..	3	3	1
+ Comfort	0 Relief	1	..	..	..	..
+ Comfort	+ Relief	..	1	6	6	6
Group IV (10 Patients) Procaine with Ascorbic Acid						
0 Comfort	0 Relief	..	..	7	7	3
0 Comfort	+ Relief	..	..	..	1	..
+ Comfort	0 Relief	..	..	..	..	..
+ Comfort	+ Relief	..	..	3	2	5

RESULTS

A total of 53 patients divided into four groups was studied. The initial group of 12 patients was given saline first, followed by procaine, and finally, morphine. The dose of procaine used was the "procaine unit" (4 mg. per kg. of body weight administered over a 20-minute period).[4] Saline and procaine were administered for 20 minutes, and evaluations of all drugs were made 30 minutes after each administration. Because of the poor results in this initial group (Table 1), further use of this dosage did not seem advisable.

Therefore, a second group of 16 patients was studied with the same order of drug administration except that procaine was now administered up to the limit of tolerance for 20 minutes (as rapidly as possible without producing unpleasant side-actions) and then allowed to drip in slowly for the next 40 minutes. Evaluations were made at 30 minutes and 60 minutes. This allowed for evaluations after both rapid and slow administrations and after two widely different doses. The results are shown in Table 1, Group II.

4. Graubard, D. J.; Robertazzi, R. W., and Peterson, M. C.: Intravenous Procaine: A Preliminary Report, New York J. Med. **47**: 2187-2192 (Oct. 15) 1947.

5. Graubard, D. J., and Peterson, M. C.: The Therapeutic Uses of Intravenous Procaine, Anesthesiology **10**: 175-187 (March) 1949.

The frequent failure of saline to relieve pain initially and the discomfort commonly associated with intravenous drip administration were considered as possibly providing a negative conditioning factor against relief from any drip medication. Therefore, in the third group procaine was given initially, followed by saline, and then morphine. Procaine here has the additional advantage of being credited with relieving those patients who would have obtained relief from a placebo. The dosage and technique were the same as in Group II. This modification produced some increased pain relief but not much increase in comfort. Also, its results did not equal those of morphine. The low number of administrations of saline and morphine resulted from five patients having no return of pain and from other patients having reactions to procaine that were too distressing to make further study advisable.

TABLE 2.—*Dose of Intravenous Procaine Used in Various Groups**

Group	Mg. per First 20 Min.		Mg. in Excess of the "Procaine Unit,"	Mg. per Hour	
	n†	Mean	Mean	n†	Mean
I.....	11	322 ± 28	57 ± 22	..	.....
II.....	12	354 ± 26	74 ± 24	11	723 ± 65
III.....	15	357 ± 24	87 ± 26	14	765 ± 46
IV‡.....	10	455 ± 32	208 ± 35	10	1,000 ± 61

* Patients in whom administration was stopped because of severe toxic reactions are omitted. The dosage is expressed as mean ± standard error of mean.
† Number of patients included.
‡ Given with equal amounts of ascorbic acid.

Because of the claims that the addition of ascorbic acid decreases the toxicity of intravenous procaine,[5] a fourth group was studied in an attempt to decrease side-actions while retaining whatever analgesic potency that might be present. Saline was not given to this group and the procaine-ascorbic acid mixture was given first, in the favorable order, as a 0.1% procaine-0.1% ascorbic acid solution. The rate of flow was adjusted to give minimal side-actions but maximum flow. The solution was allowed to run for one hour. Morphine followed the procaine-ascorbic acid. The addition of ascorbic acid permitted the administration of greater amounts of procaine than otherwise would have been possible without serious side-actions; this is indicated in Table 2. However, this increased dosage was not accompanied by increased analgesia; this is shown in Table 1, Group IV.

When the data of the first three groups only are combined (Table 3), it is apparent that, although intravenous procaine does possess some analgesic power, its effect is considerably less than that of morphine. This remains true even when pain relief alone is considered. Judging from previous work of the authors,[3] the analgesic power of procaine, when administered as specified, is of the same order as that produced by 90 mg. of pentobarbital sodium.

TABLE 3.—*Comparative Effects of Intravenous Saline, Procaine, and Morphine on Postoperative Pain*

Time of Evaluation	Saline		Procaine		Procaine + Ascorbic Acid		Morphine
	30 Min.	60 Min.	30 Min.	60 Min.	30 Min.	60 Min.	30 Min.
No. of patients.....	34	22	40	27	10	10	35
(a) 0 Comfort 0 Relief.....	25	18	18	12	7	7	7
(b) 0 Comfort + Relief.....	2	1	6	5	..	1	3
(c) + Comfort 0 Relief.....	1	..	..	2	..	..	1
(d) + Comfort + Relief.....	6	3	16	8	3	2	24
% Therapeutic effect (c and d).....	21	14	40	37	30	20	71
% Analgesic effect (b and d).....	24	18	55	48	30	30	77

The frequency of side-actions following each drug is recorded in Table 4. In addition to those listed, faintness, weakness, drowsiness, lightheadedness, a "flushed" feeling, and dulled hearing were noted after procaine; a "woozy" feeling, generalized warmth, transient abdominal cramps, and drowsiness were reported after morphine. One patient claimed to have generalized numbness and a metallic taste in his mouth for one week after procaine. Another claimed that one-half of his body was numb

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for several hours after procaine. Blood pressure was recorded during administration of the drugs, but no hypotension was observed.

An alternate method of tabulating the data is presented in Table 5. Response A indicates no pain relief with or without distressing side-actions; response B, pain relief with distressing, highly unpleasant, or serious side-actions; response C, pain relief

TABLE 4.—*Relative Side-Action Liability*

	Incidence, %			
Side-Action	Saline	Procaine	Procaine + Ascorbic Acid	Morphine
Dizziness	3	63	80	14
Nausea	6	45	30	20
Vomiting	6	23	20	14
Generalized numbness	3	30	50	0
Oppressive chest sensation	0	10	0	0
Marked apprehension	0	15	0	0
Begged to stop I. V.	0	13	0	0
Tachycardia	0	5	0	0
Shortness of breath	0	10	0	0
Blurred vision	0	20	10	0
Difficulty with speech	0	15	20	0
No. of subjects	34	40	10	35

Others following procaine (less than 5% frequency): convulsions, disorientation, paresthesias, tinnitus, and restlessness.

with minor or no unpleasant side-actions. This method is said to provide an index of clinical usefulness for each drug.[6] The general picture differs little from that presented above.

DISCUSSION

The hypothesis advanced to explain the analgesic power of intravenous procaine [7] states that increased capillary permeability exists in areas of trauma or inflammation allowing larger amounts of procaine (given intravenously) to accumulate in the diseased tissue than in normal tissues. This allows for blocking of local nocicepter nerve fibers which, when stimulated, arouse reflex vasospasm and accentuate the existing pain by anoxia and edema. Procaine interrupts this "vicious circle" and provides pain relief and improved healing by an increased blood flow. If this were true, the postoperative patient, with his very real area of trauma and inflammation, should provide the ideal subject for analgesia by intravenous procaine. Unfortunately, our data do not support this hypothesis.

It is more likely that any analgesia produced by intravenous procaine results from its action on the central nervous system. In 1944, Bigelow and Harrison [8] demonstrated that subcutaneous infiltration of procaine into one arm produced an elevation of pain threshold in the opposite arm. Although it is generally accepted that pain threshold measurements bear little relationship to analgesic effects, this observation can be construed as indicating that systemic absorption of procaine alters the psychic reaction to painful stimuli. It is possible that any drug which has effects on the psyche (as procaine has) can relieve pain to some extent simply by the distraction produced by the multitude of psychic stimuli aroused by the drug.

It is interesting to find that the best results with this drug have been reported in the treatment of those symptoms with a large psychic overlay (low back pain, itching, tinnitus), or those diseases notorious for the vagary of their symptoms and spontaneous remissions (arthritis, serum sickness, angina pectoris), or those conditions associated with minor degrees of pain (certain sprains, fractures, and burns, and following thyroidectomy and radical breast excisions). Once again the occasion arises for a plea for the use of controls in all investigations and for rigid controls (both for patient and observer) in investigating pain.

TABLE 5.—*Comparative Effects of Saline, Procaine, and Morphine Including Side-Actions*

	Saline		Procaine		Procaine + Ascorbic Acid		Morphine
Time of Evaluation	30 Min.	60 Min.	30 Min.	60 Min.	30 Min.	60 Min.	30 Min.
No. of patients	34	22	40	27	10	10	35
Response: A*	26	18	18	14	7	7	8
Response: B†	2	..	8	2	..	..	..
Response: C‡	6	4	14	11	3	3	27
% Therapeutic effect (C)	18	18	35	41	30	30	77
% Analgesic effect (B and C)	24	18	55	48	30	30	77

* No pain relief with or without distressing side-actions.
† Pain relief with distressing, highly unpleasant, or serious side-actions.
‡ Pain relief with minor or no unpleasant side-actions.

In the group of patients studied at the Massachusetts General Hospital, intravenous procaine relieved 40% of the patients in contrast to 20% with saline and 70% with morphine. (The 30 minute evaluations are used because of the greater amount of such data.) Despite the relatively small number of patients, these differences are statistically significant by the conventional chi square method. The percentage of patients relieved in this group by saline and morphine compares closely with the data in a much larger series reported previously [3] (viz: 21% for saline and 76% for morphine). In this study, the percentage of patients relieved by morphine is probably a low estimate, since it was given primarily to patients not relieved by saline or procaine.

This degree of analgesia from procaine was achieved at the cost of tremendous side-action liability, mainly unpleasant. Although one death has been reported from intravenous procaine given for the pain of arthritis [9] and severe sudden hypotension refractory to the usual methods of therapy has been reported from the use of large doses,[10] most observers have minimized the potential dangers of this drug. The authors believe that the extreme anxiety and apprehension, the dyspnea, the tachycardia (to 150 per minute), the disorientation, and the violent vomiting experienced by some patients is alarming. In six patients, the administration of procaine had to be stopped because of the magnitude of the side-actions. Patients have begged to have the infusion stopped because of the unpleasantness, and some have wept when anticipating a repetition ("I would rather have the pain."), but an equal number have enjoyed its effects.

Perhaps the doses used were excessive and, therefore, the side-actions were excessively frequent and severe. However, the low analgesia attained even with these doses and the possibility of such side-actions with small excesses in dose do not enhance the usefulness of this drug. Obviously, it is not a substitute for morphine. In addition, there is a very large variation in individual susceptibility to toxic effects of procaine. The authors have produced generalized clonic convulsions by injecting 75 mg. intravenously over a 4-minute period and have also given 800 mg. over a 20-minute period (160 mg. per 4 minutes) with dizziness alone resulting.

The rapid administration of large volumes of fluid necessary for this therapy complicates postoperative fluid balance, especially in patients having abdominal surgery and those with heart disease. The use of more concentrated solutions decreases the safety and controllability of the procedure. Very slow administration has little effect because of the rapid hydrolysis of procaine in the blood stream. Because of the rapid fluid administration, the large variation in susceptibility to toxic effects, and the possibility of serious side-actions, physician attendance is mandatory, prohibiting routine use of this therapy. These poor results have been reported by only one other observer.[9]

CONCLUSIONS

Saline, procaine, and morphine were given intravenously to the same 53 postoperative patients for treatment of pain. Saline relieved 20% of this group, procaine 40%, and morphine 70%. The degree of relief produced by procaine approximates that produced by 90 mg. of pentobarbital sodium.

The analgesia produced by intravenous procaine was accompanied by frequent unpleasant and sometimes serious side-actions. Unless procaine, administered by this route, can be demonstrated to produce significant beneficial effects on specific disease-processes, it has no place in the treatment of pain.

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THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
535 N. DEARBORN ST. . . . . CHICAGO 10, ILL.
Edited by . . . . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

VOTING PRIVILEGES

A recent editorial in the *Los Angeles Mirror* reveals the apathy shown by too many citizens of this country when elections are held. According to this newspaper, less than 50 per cent of qualified United States voters exercise their privilege of voting in national elections. In Los Angeles the voting rate is between 20 and 35 per cent, which offers a dismal showing when compared to Great Britain, where national elections are said to bring out 85 per cent of the voters. However, Los Angeles is not unique. Other cities are as delinquent in this respect.

Dallas, Texas, newspapers several weeks ago carried information on the response of the voting public in that city. According to the Dallas County Poll Tax Committee, only 26 per cent of the members of the seven leading Dallas professional groups voted in the last Presidential election. The *Dallas Times Herald* and the *Dallas Morning News* justifiably drew attention to the findings of the Poll Tax Committee. According to information supplied in these newspapers, the heaviest vote among professional groups was found in the legal profession, but even in this group only 38 per cent of the lawyers voted in 1948. The poorest showing made by professional groups was in the nursing profession, in which only 12 per cent voted. In the medical profession, 36 per cent of the physicians voted. According to the *Dallas Morning News*, "it is the doctor, the lawyer, the engineer who bemoan the threat of socialism and burdensome debts. The doctor who fears socialized medicine and does nothing at the polls to combat it is legion. The Dallas poll merely proves locally a national picture that is pitiable.

"The result is a government of pressure groups alert to step in where others fail to tread.

"Polls similar to that in Dallas show 85 per cent of labor union membership votes. The figure is 90 for those who hold government jobs. Not only do they vote, they influence others. This is their civic privilege; we might even say duty, though it is a duty with a motive.

"Socialism can easily come to this country without a vote of the people. It can come by default."

When the figures for voters are finally compiled for 1950 it probably will be found that the professional groups, particularly physicians, now show a much greater interest in voting, and the precentage of voters in these groups should in general be much higher. It certainly can be said without fear of contradiction that in the country at large there has been sharply increased interest in registering and voting on the part of the medical profession. However, there is still room for improvement, and all physicians, as well as other members of professional groups, and especially those concerned with health, should recognize their obligations as citizens in these critical times.

According to the *Los Angeles Mirror*, Boy Scouts, as a civic duty, will try to induce more citizens to vote in the 1952 elections by ringing doorbells and reminding citizens that they should go to the pools. Facetiously, the *Mirror* says, "We wish the Scouts well in their efforts to stir up a little civic conscience in our slackers, but we've got a better idea. Maybe we should think about letting the Scouts vote."

We wish the Boy Scouts well in their attempts in 1952 to induce more citizens to vote in the elections. The work would be easier, however, for the Scouts and all other groups with similar civic-minded ideas, if examples were set by professional groups who in meeting their responsibilities as citizens are fortunate in having advanced training that should put them in an advantageous position to recognize the leadership they can provide in civic activities. However, to do the best job, these persons will have to begin now to think about fully meeting their responsibilities as voters and citizens. They cannot afford to wait until the last minute, or once again apathy may result in figures as disgraceful as those reported for 1948, or, as has been said elsewhere, "Socialism can easily come to this country without a vote of the people. It can come by default."

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MORE OSCAR EWING PROPAGANDA

It is not often that a letter is reproduced in its entirety in the editorial pages of THE JOURNAL; however, in view of the discussions that have arisen concerning Oscar R. Ewing's advocation of federal intervention in health activities, the readers of this periodical will be interested in the letter reproduced here. Its writer claims that "Each communication receives individual attention and thoughtful consideration," but it is obviously a form letter, with only the date and name of the recipient being typed.

FEDERAL SECURITY AGENCY
Washington
Zone 25

November 1, 1951

Dear Mr. H. . . . . :

This will acknowledge your recent communication concerning the Nation's health. Many comments are received by the President and by the Federal Security Agency which indicate wide interest in the President's health proposals, including national health insurance.

National health insurance is not, as some believe, a proposal for socialized medicine. Socialized medicine or State medicine is a system wherein medical personnel work for the Government. Under national health insurance, the freedom of choice of doctor and patient is retained. The personal relationship between a patient and his doctor would continue.

The voluntary health insurance plans now in existence do not and cannot provide adequate benefits at low cost to the large number of people who would be included under national health insurance.

National health insurance would enable many more of us to get preventive care. It would lighten the burden of heavy medical costs during illness by spreading the costs over the years when we are well, working and earning. At present these costs accumulate when people are sick and least able to pay. We believe that national health insurance would result in better medical care for the Nation as a whole.

Each communication receives individual attention and thoughtful consideration by a staff which studies and suggests ways to improve the Nation's health. Because of the volume of mail, however, it is impossible to reply in a more personal way.

Thank you for your interest.

Sincerely yours,
(Signed) Oscar R. Ewing
Administrator

Enclosures
Mr. G— C. H—
—— Avenue
Jersey City, New Jersey

The name of the recipient of the above letter is not published but can be obtained on request. Otherwise, the letter is reproduced exactly as it was received by THE JOURNAL and speaks for itself. Although Mr. Ewing has been criticized repeatedly for using his office for propaganda purposes, his actions seem to reveal an amazing indifference to such criticism, especially when some of it it has come from members of Congress.

POSTMORTEM EXAMINATIONS ON AIR CRASH VICTIMS

According to a recent report deaths could be reduced if passengers traveled facing toward the rear of the plane. After postmortem examination of 28 victims of an air crash and fire, Teare [1] concludes that in 16 the immediate cause of death was acute flexion of the body over the safety belt. The causes of death included fractured skull (10), fractured cervical spine (1), subarachnoid hemorrhage (1), and injuries to the chest and upper part of the abdomen (16), the latter including ruptured descending thoracic aorta (8).

There was no measurable concentration of carbon monoxide in the blood of 23 victims. The other five, who had 20% or less carbon monoxide in the blood, did not reveal evidence of burns in the internal air passages. This suggests that all 28 were dead or deeply unconscious before the outbreak of fire and that the fate of the occupants would have been the same had no fire occurred.

There was a remarkable similarity of injuries to seven pairs of victims who probably were sitting together. The stewardess, who was in the tail of the aircraft, escaped death. Such observations support the belief that certain parts of aircraft are more dangerous than others when a plane crashes.

With advances in foam-protected fuel tanks the danger of fire in air crashes will diminish and, as indicated by the findings in this study, the hazard might be further lessened by having the passengers seated facing backward.

RELIABILITY OF INTERPRETATION OF CHEST X-RAY FILMS

Roentgenography of the chest has become established as an indispensable procedure in the diagnosis of thoracic disease because it so frequently reveals disease that otherwise would remain unsuspected. The clinical management and even the details of treatment in thoracic disease often are based on the interpretation of shadows observed in roentgenograms. Physicians may hesitate to question the reliability of this method of examination, although they realize well the fallibility of other diagnostic procedures that appear less mysterious to them. Shadows that appear on films must be interpreted in pathological terms. This factor of interpretation recently was subjected to critical inquiry in a careful study [1] that analyzes subjective errors of interpretation of chest x-ray films and contains information significant to all physicians.

The project involved the recording of opinions by six experienced observers, three of whom were radiologists and three of whom were internists, regarding the stability of lesions of pulmonary tuberculosis as recorded on single roentgenograms (posterior-anterior projections) taken at intervals of three months. Each observer independently reported his opinion of each pair of films and subsequently reexamined the same series of films without reference to his original interpretation. The data thus recorded were analyzed by competent biostatisticians who were able to measure the inconsistencies of interpretation and relate the scores of each reader with the others and with his own previous opinions.

The results will surprise any persons who have deep faith in the reliability of roentgenographic methods of examination in thoracic disease. It was revealed that a second observer will disagree with the first observer in about one-third of all instances and, what is more surprising, when the same observer reviews the same film a second time after an appropriately long interval, he will find disagreement between his two opinions in about one-fifth of cases studied.

These results in no way decrease the recognized necessity of roentgenographic examination of the chest, but they do emphasize the fact, long known to many physicians experienced in thoracic disease, that clinical management of thoracic disease must be based on many types of clinical and laboratory data and not on roentgenography alone. Furthermore, the single posterior-anterior chest film frequently does not constitute complete roentgenologic examination, for fluoroscopy, stereoscopy, tomography, and specially projected views may add materially to the accuracy of the examination in special circumstances. There is no substitute for the true clinician, whose difficult task involves synthesis of different types of evidence in formulating his program of management for the patient. In dealing with thoracic disease, the physician must rely heavily on roentgenography, but he should realize that the opinion of the dynamic status of pulmonary tuberculosis would be reversed frequently if a second expert viewed the films or even if the same ob-

1. E. Teare, D.: Post-Mortem Examinations on Air-Crash Victims, Brit. M. J. 2: 707 (Sept. 22) 1951.

1. J. Yerushalmy and others: An Evaluation of the Role of Serial Chest Roentgenograms in Estimating the Progress of Disease in Patients with Pulmonary Tuberculosis, Am. Rev. Tuberc. 64: 225 (Sept.) 1951.

server should submit a second opinion after he has forgotten the first report. Anyone who doubts this statement should subject it to adequate test.

PROLONGED CLOTTING TIME IN HIBERNATION

Svihla [1] and his associates of the Department of Zoology, University of Washington, Seattle, noted that, with a 23-gage hypodermic needle, heart blood can be safely drawn from active ground squirrels but that the same technique is usually fatal with dormant (estivating) squirrels. Necropsies showed that death was due to internal hemorrhages. These squirrels thus acted as if they were suffering from a clotting deficiency of the blood.

Studies of blood clotting were therefore made on active and dormant squirrels. By Howell's technique it was found that on an average the blood of nondormant squirrels coagulates firmly in about eight minutes. The blood of a dormant squirrel requires on an average 49 minutes to form a partial clot, a firm clot never forming.

Svihla believes that this prolongation of blood-clotting time is a purposeful adaptation for the dormant state. During this period the heart beats very slowly, with a marked decrease in the rate of blood flow. A mechanism that would tend to prevent thrombosis during this period would, therefore, be of great survival value to the animal. The factors involved in this prolongation of clotting time are being studied and may yield further information about the mechanism of blood clotting.

CONVERSION OF PALMITIC ACID TO GLUCOSE

The conversion of ingested carbohydrate into fat in animals and man is a commonly recognized and extremely useful phenomenon; the reverse reaction, on the other hand, had been debated for many years, and definite information regarding this transformation would be of great physiological significance. Using the long-lived radioactive isotope C^{14}, Strisower, Chaikoff and Weinman [1] have studied the conversion of the long chain palmitic acid into glucose by rats rendered diabetic with alloxan. The fatty acid used in these studies was labeled in either the 1 or the 6 position and was converted into the neutral fat tripalmitin before testing.

Two types of studies were carried out to measure the conversion of the labeled fatty acid into glucose. One was based on the recovery of the radioactive carbon in the glucose excreted by the diabetic rats in 24 hours, whereas the second depended on the amount of radioactive carbon in the extracellular glucose one hour after the injection of an emulsion of the labeled tripalmitin. In the diabetic rats, 3 to 6% of the injected radioactive carbon was recovered in the urinary glucose. Earlier, it had been reported by this group that about one-half of the amount of glucose turned over in the alloxan diabetic rat is excreted in the urine. [2] Thus it was calculated that at least 6 to 12% of the injected radioactive carbon is incorporated into glucose in 24 hours. From 1.6 to 2.9% of the injected isotopic carbon was calculated to be present in the extracellular glucose in the case of the diabetic rat and only 0.5 to 0.9% in the normal animal.

While the contribution of fatty acid to glucose formation is less than 10% of the total glucose turned over per hour in the diabetic animal, it should be noted that the amount of C^{14} recovered in the glucose is more than half that found in the expired air in this one hour period. Thus, these recent studies show that, when compared to the oxidation of fatty acids to carbon dioxide, the conversion to glucose in the diabetic rat is a highly significant process.

ALTERATIONS OF SODIUM, POTASSIUM, AND CHLORIDE IN DISEASE

The fundamental importance of alterations in the ionic concentrations, particularly of sodium, potassium, and chloride, in various body fluids and tissues in pathologic conditions and concomitant changes in water balance have become well recognized. An excellent current review [1] summarizes recent developments in this general field. As the author points out, the past two decades have been characterized by the introduction of many improved physical and physicochemical procedures, such as the flame photometer and isotopic methods, which have greatly expanded and extended knowledge of ionic and fluid changes in disease. Among the problems under current extensive investigation by the newer techniques is that of the relation of the adrenal glands to ionic balance. Recent studies, the review states, appear to indicate that the primary effect of the "mineral" corticoid hormones of the adrenal is the regulation of the distribution of sodium, potassium, and chloride and water between intracellular and extracellular fluid compartments. An earlier view held that the primary effect of these hormones was on renal excretion. The possible effects of 11,17-oxysteroids, including cortisone, on electrolyte and water balance remain equivocal. Ionic alterations in states of dehydration have also been extensively studied during the past few years. While generalization is rather difficult, a loss of intracellular potassium appears to be a consistent finding in dehydration from a variety of causes. This observation has led to the use of potassium salts therapeutically in this condition.

Other situations in which changes in sodium, potassium, and chloride concentrations in body tissues and fluids are discussed by the reviewer include diabetes, neuromuscular disorders, renal disease, cardiovascular pathology, shock, surgical conditions, and fever. In each instance, profound ionic and water alterations may occur, and their correction may present a major therapeutic problem. In fact, it has been stated,[2] that the surgeon must be as much concerned in the surgical patient with physiological fluid replacement as with surgical technique. Certainly, recent advances have emphasized the importance of fluid and electrolyte balance in planning and evaluating modern therapy.

1. Svihla, A.; Bowman, H. R., and Ritenour, R.: Prolongation of Clotting Time in Estivating Mammals, Science **114**: 298 (Sept. 21) 1951.

1. Strisower, E. H.; Chaikoff, I. L., and Weinman, E. O.: Conversion of C14-Palmitic Acid to Glucose: Normal and Diabetic Rats, J. Biol. Chem. **192**: 453, 1951.

2. Feller, D. O.; Strisower, E. H., and Chaikoff, I. L.: J. Biol. Chem. **187**:57, 1950.

1. Overman, R. R.: Sodium, Potassium and Chloride Alterations in Disease, Physiol. Rev. **31**: 285 (July) 1951.

2. Lockwood, J. S., and Randall, H. T.: Place of Electrolyte Studies in Surgical Patients, Bull. New York Acad. Med. **25**: 228 (April) 1949.

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GOVERNMENT SERVICES

ARMY

Enlisted Aidmen to Train at Camp Pickett.—Army medical aidmen will be given basic and branch training in the future at Camp Pickett, Va., the Department of the Army announced November 16. Medical replacement training centers currently in operation at Brooke Army Medical Center, Fort Sam Houston, Texas, and Fort George G. Meade, Md., are to be inactivated. Staffs and facilities will be transferred to Camp Pickett. Approximately 1,450 members of the cadre and staff at Fort Meade and 650 from Brooke will be involved in the shift. Personnel now undergoing training at these installations will not be affected, but all new medical service recruits will be assigned to Camp Pickett. Medical service officers and enlisted technical personnel will continue to train at the Texas post. Camp Pickett can accommodate the increasing number of medical aidmen required by the expansion of the Army. A maximum of 8,000 men can be trained at one time by this consolidation.

The medical replacement training center course now includes 16 weeks of intensive field and classroom instruction in the fundamentals of being a soldier, together with specialized training in techniques of administering blood and plasma, drugs, or other emergency measures to the wounded on the battlefield.

AIR FORCE

National Air Council Award.—The National Air Council Award for outstanding achievement in aviation research and experiment was awarded to Maj. John P. Stapp, USAF (MC), by Secretary of Defense Robert A. Lovett at a recent ceremony in the Secretary's office in the Pentagon. The award is made annually to the members of the Air Force and of the Navy who, during the previous fiscal year, have contributed most in the field of aviation research and experiment. The award is not restricted to medical research, but this is the second time aeromedical research activities have been so honored. Maj. Vincent Mazza received the award in 1949 for his work in proving the feasibility of using the ejection seat at high speeds. The Navy recipient of the NAC award for 1951 is Capt. Walter S. Diel, for his work in organizing and directing the Navy's transonic flight program.

The citation outlines Major Stapp's achievement in aviation medical research: the obtaining of data on deceleration forces encountered in aircraft crashes. To determine how much impact a pilot wearing safety harness could withstand and still survive, Major Stapp subjected himself to extreme physical forces while riding a specially constructed rocket-propelled decelerator sled during a series of tests. In performing the tests his normal body weight was increased as much as 45 times in some instances. This is equivalent to a force of nearly four tons. As a result of these tests, Major Stapp has produced valuable data pertinent to future designs of aircraft and safety devices.

Representation at Medical Meetings.—As part of the program to keep Air Force medical practice completely up-to-date, representatives of the Air Force are sent to outstanding medical meetings over the country. Col. Fratis L. Duff, chief of the Preventive Medicine Division for the Air Force Surgeon General, recently attended a three-day symposium on rheumatic fever sponsored by the Minnesota Heart Association at the University of Minnesota. Included in the program was a report on epidemiological studies conducted by the armed forces as well as recent developments in the theory of rheumatic fever. Colonel Duff also attended a recent conference on health and safety in aviation sponsored by the Harvard School of Public Health. The first part of the program was devoted to prevention of human failure in flight, and round table discussions on health maintenance with special reference to coronary heart disease, hypotension, and diabetes. There were also reports on recent advances in study of the disfunctioning of the adrenal cortex resulting from stress situations, respiratory, and circulatory failures. The remainder of the program was devoted to public health and aviation, modern trends in air transportation, equipment design, jet propulsion, and high speed aircraft.

Pathologists Attend Washington Seminar.—Nine U. S. Air Force pathologists attended a special indoctrination course at the Armed Forces Institute of Pathology in November. The course provided guidance on pathological procedure as applied to the Air Force. The seminar was conducted by Col. R. M. Thompson, deputy director of the institute, under the direction of Brig. Gen. Elbert DeCoursey, institute head. Attending were Maj. George J. Heid, stationed at Wright-Patterson Air Force Base, Ohio; 1st Lt. George W. Knabe Jr., Lackland Air Force Base, Texas; 1st Lt. Harold F. Knight, Sampson Air Force Base, N. Y.; 1st Lt. Michael J. Lyons, Maxwell Air Force Base, Ala.; 1st Lt. Albert Nemez, Langley Air Force Base, Va.; 1st Lt. Stanley R. Opler, Westover Air Force Base, Mass.; 1st Lt. Henry E. Pure, Lackland Air Force Base, Texas; and 1st Lt. Clarence Robinson Jr., Francis E. Warren Air Force Base, Wyo.

Combine Medical Research and Human Resources Division.—A newly formed Aeromedical and Human Resources Division has been established in the office of Air Force Deputy Chief of Staff for Development. The new division has been created by combining the research and development missions of the former Medical Research Division of the Office of the Surgeon General, USAF, with the former Human Resources Division of the Directorate of Research and Development. The combined division maintains staff cognizance over medical and human resources research and development programs for the Air Force. Individual branches include aviation medicine, human engineering and training, personnel and manpower, and human relations. Heading the new division is Col. A. P. Gagge, formerly chief of the medical research division. Alfred H. Lawton, M.D., is medical research advisor and Glen Finch, Ph.D., is human resources research advisor.

New Chief for Medical Consultants Division.—Col. Oscar S. Reeder, USAF (MC), has assumed duties as chief of the Medical Consultants Division for the Office of Air Force Surgeon General. As head of this division, he will evaluate, plan, and administer the professional aspects of the prophylaxis, diagnosis, and treatment of the sick and injured. The division further assists and advises the Surgeon General in all matters pertaining to the professional care of patients. The organization and programs of Air Force medical installations and the quality, numbers, distribution, and assignment of medical specialists are also supervised by this division. Colonel Reeder replaces Col. John F. Dominick, who has been assigned to headquarters, U. S. Air Force in Europe, for duty as chief of the Professional Services Division.

Personal.—Dr. Louis H. Bauer, president-elect of the American Medical Association, was recently designated chairman of the semiannual National Consultants Conference convened by the Air Force Surgeon General.

VETERANS ADMINISTRATION

Residencies in Psychiatry Available.—Residencies in psychiatry are available at the Veterans Administration Hospital, Hines, Ill., beginning January 1, 1952, for a three year period. The residency program is under the direction of the Department of Psychiatry, University of Illinois. The program of lectures, conferences, and seminars at Hines is coupled with rotation for special services in Chicago. The training is fully accredited by the American Board of Psychiatry and Neurology. The hospital is within commuting distance of all other psychiatric facilities in the Chicago area.

ORGANIZATION SECTION

SCIENTIFIC EXHIBIT—CHICAGO SESSION

Several special features will be presented in the Scientific Exhibit at the Chicago Session, according to present plans.

Heart disease will be shown in several exhibits, with a question and answer conference in an adjoining area. The American Heart Association, the Illinois Heart Association, and the Chicago Heart Association are cooperating, with Louis N. Katz, M.D., Chicago, acting as chairman. The subject of diabetes will be presented by the American Diabetes Association, with several exhibits and a question and answer conference. Howard F. Root, M.D., Boston, is arranging the program.

An exhibit symposium on cancer is being arranged with the cooperation of the Illinois Division of the American Cancer Society. Various exhibits will cover different phases of the cancer problem. The exhibit symposium on overweight, nutrition, and health, which was shown at Atlantic City and Los Angeles, will be repeated in Chicago, with such changes as seem timely. A question and answer conference will be conducted in an adjoining area. James R. Wilson, M.D., Chicago, is arranging the program. The special exhibit on fractures will be continued, with demonstrations in six booths. Frederick A. Jostes, M.D., St. Louis, is chairman of the committee in charge.

The Section on Preventive and Industrial Medicine and Public Health will again feature an exhibit symposium on noise and health, with the cooperation of the Council on Physical Medicine and Rehabilitation and the Council on Industrial Health of the American Medical Association, the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology, the Acoustical Society of America, and the Acoustical Materials Association. Howard A. Carter, Chicago, will be in charge.

The Section on Physical Medicine and Rehabilitation, with the cooperation of the American National Red Cross, the Council on Physical Medicine and Rehabilitation of the American Medical Association, and various other agencies, will present the essential features of artificial respiration. The back pressure-arm lift method will be demonstrated in the booth, and plans are under consideration for demonstrations in Lake Michigan, in a location adjoining Navy Pier. Carl J. Potthoff, M.D., Washington, D. C., is in charge of the program.

The Section on Urology will continue the discussion periods inaugurated last year, in which all the urological exhibits are discussed at certain hours of the day by competent urologists. Roger W. Barnes, M.D., Los Angeles, is chairman of the section exhibit committee.

Motion pictures will be shown continuously throughout the week in two motion picture theaters adjoining the Scientific Exhibit. The Committee on Medical Motion Pictures of the American Medical Association will preview all films submitted. It is expected that an outstanding program will be arranged.

Each of the 19 Sections of the Scientific Assembly will sponsor a group of exhibits dealing with its particular specialty in medicine. Application blanks for space in the Scientific Exhibit and for time on the motion picture program may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Applications close on Jan. 15, 1952.

Portable Exhibits

A new style of exhibit is being developed by the Association's Bureau of Exhibits to fill a need for attractive portable exhibits. The weight of these units is 40 to 60 lb. each, and they are small enough to be placed in the rear seat of an automobile and taken to such group sessions as those of the Parent Teachers Association, women's clubs, and school science classes.

The exhibit on "School Health Services" is now available and a portable exhibit on "Home Accidents" is under construction, as well as a unit dealing with the subject of appendicitis. The portable exhibit on appendicitis will be available on both a loan and a purchase basis. The Association has assumed all the creative cost and the cost of the initial unit. The state and county medical societies may obtain different units at a marked saving. Each portable exhibit on appendicitis will be provided with a shipping case. The units will cost $285 each.

Animals in Research

A new exhibit on "Animals in Research" has been developed by cooperation with representatives from the National Society for Medical Research, veterinary groups, and the Bureau of Exhibits.

The positive gains obtained through the use of animals in research is depicted in the exhibit, which emphasizes the benefits accruing to farm animals and household pets, as well as the benefits obtained by humans through animals in research. The need for continued research is set forth in one portion of the exhibit entitled "The Benefits of the Future."

A continuous projector is included in the central portion of the exhibit devoted to a series of slides entitled "Thanks to Animals." Here is shown the part that has been played by animals in the treatment of obesity, the development of the iron lung, the "blue baby" operation, bronchoscopy, vaccination for smallpox, immunization for diphtheria, the benefits of the sulfonamides, and the treatment of burns. This exhibit is available to state and county medical societies on a loan basis without charge. The only cost involved is the transportation of the exhibit.

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LIBRARY LENDING SERVICE

Beginning Jan. 1, 1952, the A. M. A. Library will offer its Periodical Lending and Package Library Services free to the members of the American Medical Association. Members of the Student American Medical Association are also eligible for the same service, but their requests must bear the signature of a faculty council member. Hereafter, the fee to nonmembers will be 50 cents for each package library and 15 cents for each periodical borrowed.

REGISTRATION AT CLINICAL SESSION, LOS ANGELES, DEC. 4-7, 1951

Alabama	7	Nebraska	22
Alaska	1	Nevada	9
Arizona	47	New Hampshire	1
Arkansas	6	New Jersey	14
California	2,184	New Mexico	18
Los Angeles	1,317	New York	46
Canal Zone	1	North Carolina	3
Colorado	32	North Dakota	11
Connecticut	12	Ohio	30
Delaware	1	Oklahoma	21
D. C.	25	Oregon	32
Florida	7	Pennsylvania	29
Georgia	5	Puerto Rico	0
Hawaii	5	Rhode Island	2
Idaho	12	South Carolina	3
Illinois	97	South Dakota	4
Indiana	38	Tennessee	11
Iowa	27	Texas	50
Kansas	11	Utah	30
Kentucky	5	Vermont	1
Louisiana	15	Virginia	10
Maine	2	Washington	54
Maryland	5	West Virginia	3
Massachusetts	15	Wisconsin	22
Michigan	31	Wyoming	5
Minnesota	22	From foreign countries	20
Mississippi	3		
Missouri	18	Total	4,419
Montana	17		

MEDICAL NEWS

CONNECTICUT

Congenital Heart Disease Clinic.—A clinic for "blue babies" and other children with congenital heart malformations amenable to surgery has been opened at the Grace-New Haven Community Hospital by the Children's Bureau with the cooperation of the state health department. This is the first of such centers that the Children's Bureau plans to set up in its expansion program of financial assistance to states for this purpose. Beginning this fiscal year the Children's Bureau intends to allocate $100,000 annually for this activity. Surgical and hospital care and related services will cost an average of about $1,000 for each baby treated, according to the bureau. It is reported that 7,335 infants died in 1948 of congenital malformations of the cardiovascular system.

DELAWARE

Society News.—At the December meeting of the Delaware Academy of General Practice in Wilmington, Dr. Robert B. Greenblatt, professor of endocrinology at the Medical College of Georgia, Augusta, spoke on "The Sexual Attributes and Potential of Man—An Endocrine Study." The following officers, all of Wilmington, were elected for 1952: Dr. J. Jesse Selinkoff, president; Dr. Arthur J. Heather, vice-president; Dr. Marjorie E. Conrad, secretary, and Dr. Harry Taylor, treasurer.

GEORGIA

Society News.—At the November meeting of the Atlanta Eye, Ear, Nose, and Throat Society the following officers were elected for 1952: Dr. Ferdinand Calhoun Jr., president; Dr. William C. Hathcock, vice-president, and Dr. James T. King, reelected secretary-treasurer.

Symposium on Alcoholism.—The Georgia Commission on Alcoholism will hold a symposium on alcoholism in the Atlanta Municipal Auditorium on January 18. Out-of-state speakers on the program include three from New Haven, Conn.: Raymond G. McCarthy, M.A., executive director, Yale (University) Plan Clinic; Leon A. Greenberg, Ph.D., assistant director, Laboratory of Applied Physiology, Yale, and Ralph M. Henderson, LL.B., Section of Alcohol Studies, Yale. The fourth speaker is Dr. Ebbe C. Hoff, Richmond, medical director, Virginia Program on Alcoholism.

ILLINOIS

Report on Communicable Diseases.—The number of Illinois deaths caused by 6 of 10 major communicable diseases decreased during the first half of the year as compared to the similar period in 1950, the state department of public health announced December 5. The greatest decrease was reported in deaths from all forms of tuberculosis, which dropped from 1,116 during the first half of 1950 to 936 the first six months this year. For pulmonary tuberculosis alone, deaths dropped from 1,029 to 895. Whooping cough fatalities decreased from 20 to 7, influenza deaths from 94 to 83, and meningitis deaths from 28 to 25. No death was reported as a result of diphtheria in the first six months this year as against two for the same period last year. Poliomyelitis, which resulted in nine fatalities in the first half of 1950, caused six deaths this year. Measles, however, caused 26 deaths this year compared to 4 last year. Pneumonia deaths increased from 1,253 to 1,360, encephalitis deaths from 5 to 15, and syphilis fatalities from 226 to 254.

Chicago

Society News.—The North Side Branch of the Chicago Medical Society will hear Dr. John M. Waugh, head of the section in general surgery, Mayo Clinic, Rochester, Minn., speak January 3 on "Sphincter Conservation in the Management of Carcinoma of the Rectum." The meeting will be held at the Drake Hotel at 8 p. m. Dr. Paul H. Holinger, professor of bronchoesophagology, University of Illinois, will also speak on "Management of the Patient with Hoarseness."

Joint Meeting on January 16.—The Chicago Medical Society and the Institute of Medicine will meet jointly January 16 at 8 p. m. in the John B. Murphy Auditorium. Dr. Marion A. Blankenhorn, director of the department of internal medicine at Cincinnati General Hospital, will speak on "Pneumonia in the General Hospital—Present Day Problems." The second speaker will be Dr. Carl V. Moore, professor of medicine at the Washington University School of Medicine, St. Louis, who will discuss "Recent Advances in Management of Blood Dyscrasias."

MARYLAND

Symposium on the Physician in Court.—A discussion of the physician in court was presented in Baltimore December 7. Expert testimony was given from the viewpoint of trial counsel, industrial medicine, traumatic surgery, psychiatry, and the jurist. Speakers were Robert E. Coughlan Jr., member of the Baltimore City Bar Association; Dr. Thomas C. Wolff, associate professor of medicine at the University of Maryland, Baltimore; Dr. George O. Eaton, assistant professor of orthopedic surgery at Johns Hopkins University School of Medicine, Baltimore; Dr. Manfred S. Guttmacher, medical officer, Supreme Bench of Baltimore, and the Hon. W. Conwell Smith, chief judge, Supreme Bench of Baltimore. The program was arranged by the Joint Committee on Medicolegal Problems of the Baltimore City Bar Association and the Medical and Chirurgical Faculty of the State of Maryland.

MASSACHUSETTS

Tufts Medical Alumni Lecture.—The annual medical alumni lecture will be given January 10 at 11 a. m. at Tufts College Medical School by Dr. Jesse E. Edwards, consulting physician, Mayo Clinic, Rochester, Minn. His subject will be "Advances in Pathology of Cardiovascular Diseases." This lecture is given annually by a distinguished alumnus of Tufts College Medical School who is not on its faculty. Physicians and students are invited to attend.

MINNESOTA

Course in Clinical Neurology.—Dr. Harold G. Wolff, professor of medicine and associate professor of psychiatry at Cornell University Medical College, New York, will give the annual J. B. Johnston Lecture at 8:15 p. m. January 30. His subject will be "On the Nature of Pain." He will also participate in a continuation course for physicians in clinical neurology that will be presented at the Center for Continuation Study January 28-February 9, 1952. Other visiting faculty members for the course include Dr. Benjamin Boshes, Evanston, Ill.; Dr. H. Houston Merritt, New York, and Dr. Henry G. Schwartz, St. Louis. Dr. A. B. Baker, professor and head of the division of neurology, is chairman for the course and will be joined by members of the faculty of the University of Minnesota Medical School and the Mayo Foundation.

MISSISSIPPI

State Secretary Ends 30 Years in Office.—Dr. Tom Dye, Clarksdale, resigned December 1 as secretary of the Mississippi State Medical Association, a position he had held continuously for more than three decades. Dr. George E. Twente, Jackson, has been appointed to fill the unexpired term of office. After graduation from Tulane University, Dr. Dye practiced successively in Florence, Sherard, and Longwood before establishing his residence at Clarksdale. In 1909 he was elected first district councilor of the Mississippi State Medical Association and served seven years in this office until his election as president in 1916.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

MISSOURI

Society Election.—At the annual meeting of the Kansas City Southwest Clinical Society November 28, the following officers were elected: Dr. John A. Growdon, Kansas City, president; Dr. Hubert M. Parker, Kansas City, president-elect; Dr. Galen M. Tice, Kansas City, Kan., secretary; Dr. E. Kip Robinson, Kansas City, treasurer, and Dr. Maurice J. Ryan, Kansas City, Kan., director of clinics.

Study Club Program.—The following programs for 1952 have been arranged by the General Practitioners Study Club of Greater St. Louis. All speakers are from St. Louis.

January 16, Robert E. Ryan, Headache—Migraine and Its Differential Diagnosis and Treatment.
February 20, Roland M. Klenime, New Methods of Diagnosis in Neurosurgery.
March 19, Joseph Grindon, Discussion of the Common Skin Diseases and Their Treatment.
April 16, John A. Virant, Ear, Nose, and Throat Problems of Interest to the General Practitioner.

NEW YORK

Staff Journal Club.—This group, formed with the cooperation of the Medical Society of the County of Wyoming, meets once a month to promote understanding between specialists on local hospital staffs and general practitioners in the county. Meetings are held at the home of one of the doctors, with all members of the county medical society invited to attend.

Congenital Heart Disease Clinic.—The University of Rochester School of Medicine and Dentistry has expanded and coordinated its study of congenital heart disease into a regular clinic facility. The clinic is a joint project of the departments of radiology, medicine, surgery, and pediatrics under the direction of Dr. George H. Ramsey, professor of radiology. Provision is being made for clinic, division, and private patients.

Academy Desires Research Papers.—The New York Academy of Medicine is seeking research papers by investigators in New York and neighboring cities within a radius of 100 miles to be presented at evening meetings April 23 and 24. The presentations must be the results of original research in clinical medicine or surgery. Preference will be given papers that have not been presented before a national or local society (other than intramural). An abstract of the proposed presentation in quadruplicate, not to exceed 500 words, should be sent to the secretary of the Committee on Medical Education of the academy, 2 East 103rd St., New York 29, not later than February 15. A formal invitation to participate will then be extended by the committee.

New York City

Pollitzer Lecture.—The department of dermatology and syphilology of the New York University Post-Graduate Medical School announces that the second Sigmund Pollitzer Lecture will be given by Dr. Jerome W. Conn on February 1 at 4 p. m. in the Main Lecture Hall of the College of Medicine. Dr. Conn is professor of internal medicine at the University of Michigan Medical School, Ann Arbor, and chief of the division of endocrinology and metabolism at University Hospital. The title of his lecture will be "The Influence of Adrenal Cortical Activity on the Electrolyte Composition of Thermal Sweat."

Hospital Superintendent Joins Veterans Administration.—Dr. Alexander W. Kruger, general medical superintendent of the city's department of hospitals, resigned November 30 to join the department of medicine and surgery of the Veterans Administration in Washington, D. C., the *New York Times* reported. Dr. Kruger has been associated with the department of hospitals since 1934 when he became executive physician at Morrisania City Hospital in the Bronx. As general medical superintendent he had charge of the administration of the eleven municipal hospitals in the Bronx, Brooklyn, and Queens.

NORTH CAROLINA

Dedicate Industrial Medical Center.—Dedication of the medical center of the Ecusta Paper Corporation, a subsidiary of Olin Industries, Inc., of Pisgah Forest, was held November 9. Guests of honor included Dr. Charles L. Newland, Brevard, president, Transylvania County Medical Society, and several society members, and the following visitors: Dr. Edward C. Holmblad, Chicago; Dr. George H. Gehrmann, Wilmington, Del.; Dr. Walter R. Berryhill, Chapel Hill; Haywood M. Taylor, Ph.D., Durham, and Dr. George T. Harrell, Winston-Salem.

TEXAS

Dedicate Experimental Science Building.—Detlev W. Bronk, Ph.D., president of Johns Hopkins University, was the speaker at the dedication of the experimental science building of the University of Texas, Austin, on December 7. The new building will house the biochemistry institute and the department of zoology of the university. The Texas Branch of the Society of American Bacteriologists and the Texas Academy of Science held their annual meeting in connection with the dedication ceremonies.

Scholarship in Preventive Medicine.—Following the recent death of Dr. Joseph B. Kass, Detroit, of the class of 1913 at the University of Texas Medical School, Galveston, it was learned that he had made provision for the endowment of a research scholarship in preventive medicine. This scholarship had been maintained by Dr. Kass since 1922. It was established for the encouragement of research in preventive medicine, and is awarded annually to a medical student by a special committee.

WEST VIRGINIA

Diabetes Committee Discharged.—The West Virginia State Medical Association's committee on diabetes has been officially discharged by the council with thanks expressed by the council members for the work done since the committee was created months ago. It was agreed that if the committee were kept alive, there would be considerable overlapping of activities with the state diabetes association.

Annual Pilgrim Meet.—The annual "Pilgrim Meet" of the West Virginia Obstetrical and Gynecological Society was held in Columbus, Ohio, November 10. Those present attended operative clinics at the new Ohio State University Hospital in the morning, and the program was devoted to didactic lectures in the afternoon. Dr. Allan C. Barnes, chairman, department of obstetrics and gynecology, Ohio State University College of Medicine, Columbus, was host at a cocktail party at his home preceding the banquet. The "Pilgrim Meet" is an annual affair organized by the late Dr. Harry G. Steele of Bluefield and is usually held during the winter months.

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GENERAL

President of Rockefeller Foundation.—Dean Rusk, Assistant Secretary of State for Far Eastern Affairs, has been invited to become president of the Rockefeller Foundation on the retirement of Chester I. Barnard, when Mr. Barnard reaches the age limit June 30. Mr. Rusk has been a trustee of the foundation since April, 1950.

Clinic Administrators Meeting.—The American College of Clinic Administrators will meet January 13-15 at the Conrad Hilton Hotel, Chicago, under the presidency of Dr. Robert J. Wilkinson Jr., Huntington, W. Va. Eight papers will be presented. At the banquet January 14 the Hon. Rush D. Holt, Weston, W. Va., former U. S. senator from West Virginia, will speak on "Fable of the Free Lunch."

Meetings on Surgery of the Hand.—The American Society for Surgery of the Hand will hold its annual meeting January 25 at the Palmer House, Chicago, under the presidency of Dr. Michael L. Mason, Chicago. The following will speak by invitation:

J. Leonard Goldner, Durham, N. C., Deformities of the Hand Incident to Pathology of the Extensor and Intrinsic Muscle Mechanisms.
Frederick L. Liebolt, New York, Luxation of the Distal Radioulnar Joint.
Carmelo C. Vitale, Brooklyn, Reconstructive Surgery for Ulnar Shaft Defects in Growing Children.
Frederick H. Vom Saal, New York, Intramedullary Fixation of the Hand and Fingers.

National Board of Examiners.—On December 1 Everett S. Elwood, executive secretary of the National Board of Medical Examiners since 1921, reached the retirement age. He has been succeeded by Dr. John P. Hubbard, Philadelphia, who was ap-

pointed associate secretary in 1950. Mr. Elwood will continue his association with the board as editor and consultant on state medical board relations. Dr. Hubbard, who is also professor of public health and preventive medicine at the University of Pennsylvania, has been working with the national board during the past 18 months, revising the examinations in accord with advances in medical education.

Society Elections.—Officers elected November 2 at the annual meeting of the Central Society for Clinical Research include: Dr. W. Barry Wood, Jr., St. Louis, president; Dr. George E. Burch, New Orleans, vice-president, and Dr. Kenneth G. Kohlstaedt, Indianapolis, secretary-treasurer.——Dr. Herbert C. Schenck, Atlanta, Ga., was elected president of the Southern Tuberculosis Conference at its fall meeting in Chattanooga, Tenn. He is director of the Tuberculosis Control Division, Georgia Department of Public Health. Other new officers are K. W. Grimley, executive secretary, Alabama Tuberculosis Association, vice-president, and Frank W. Webster, executive secretary, North Carolina Tuberculosis Association, secretary-treasurer. The Southern Trudeau Society, medical section of the conference meeting at the same time, elected Dr. James D. Murphy of Oteen, N. C., president. Dr. Murphy is chief of the surgical service, Veterans Administration Hospital, Oteen. Dr. David H. Waterman, Knoxville, Tenn., was elected vice-president, and Dr. Perry M. Huggin, Knoxville, was reelected secretary.

Report of Multiple Sclerosis Society.—The first annual report of the National Multiple Sclerosis Society records the results of the first five years of work by the society from October, 1946, when it was formed, to July, 1951. The society has grown to a national membership of over 19,000 with twelve chapters. It has raised $739,955. About 47 cents of each dollar spent by the society since its formation supported its 17 research projects. Although most projects deal with basic research, seven multiple sclerosis clinics have been established to provide centers where treatment that may be helpful can be evaluated and physiotherapy given where facilities permit. The research program covers such studies as allergy, myelin destruction, psychological factors, evaluation of corticotropin (ACTH), biochemical studies, and virus studies. Most of the society's financial support (70%) has come from patients, their relatives, and friends, and the remainder from charitable foundations. In the past year the society has published a medical manual for physicians aimed at keeping them posted on all current developments in the field, and a rehabilitation manual designed for physicians and physiotherapists.

College of Surgeons Section Meeting.—The American College of Surgeons will hold a section meeting January 10-12 at The Tutwiler in Birmingham, Ala. At the opening meeting Dr. Fred W. Rankin, clinical professor of surgery at the University of Louisville (Ky.) School of Medicine, will speak on "Carcinoma of the Gastrointestinal Tract." The program includes the following panel discussions and symposiums:

Hysterectomy: Total, Subtotal, or Vaginal, William N. Jones, Birmingham, moderator, with Louise H. Branscomb and Samuel Buford Word, both of Birmingham.

Intestinal Obstruction,' Ira A. Ferguson, Atlanta, moderator, with Arthur I. Chenoweth, Birmingham; Walter G. Maddock, Chicago, and Marcus M. Ravitch, Baltimore.

Symposium on Trauma, Peter B. Wright, Augusta; James H. Semans, Atlanta, and Marcus M. Ravitch, Baltimore.

Symposium on Cancer, James Barrett Brown, St. Louis; Champ Lyons, Birmingham; R. Lee Clark Jr., and coauthor, George J. Ehni, both of Houston.

Breast Tumors, I. Mims Gage, New Orleans, moderator, with Joseph A. Cunningham, Birmingham; James Elliott Scarborough Jr., Atlanta, Ga., and Hoke Wammock, Augusta.

Bleeding from the Gastrointestinal Tract, Fred W. Rankin, moderator, with Ralph F. Bowers, Memphis; Joseph M. Donald, Birmingham, and David Henry Poer, Atlanta.

At the dinner meeting January 11 Dr. Paul R. Hawley, Chicago, director of the American College of Surgeons, will speak on "Your College: What It Means to You and to Me." A special program for otolaryngologists and ophthalmologists will be given on January 12. It includes a symposium on malignant exophthalmos by Drs. Arthur M. Freeman, Donald B. Sweeney, and Beamon S. Cooley Jr., Birmingham.

Venereal Diseases in Seven Cities.—The Statistical Service and the Social Hygiene Division of the New York Tuberculosis and Health Association published December 3 a tabulation on cases of syphilis and gonorrhea reported in seven leading American cities for 1941-1951 inclusive. The figures are based on reports to the United States Public Health Service by New York, Chicago, Philadelphia, Los Angeles, Detroit, Baltimore, and Cleveland. For each city there has been a definite decline in the number of cases of syphilis (all stages) reported between 1941 and 1951 and an increase in the total number of cases of gonorrhea reported for these cities in the same period. A similar trend of fewer cases of syphilis and more cases of gonorrhea was evidenced in the reports for the United States as a whole; 477,841 syphilis cases of all stages in 1941, and 231,567 for the year 1950. Cases of primary and secondary syphilis, which represent the categories that are contagious and of major public health interest, likewise declined in numbers. As to congenital syphilis, the trend is also downward. A total of 1,040 cases was reported in 1941 in New York City and 1,029 in 1942. By 1950 these reports dropped to 485 and to 510 in 1951. The other cities reported a similar or even larger decline. Gonorrhea cases reported for the entire United States reached a peak in the years 1946 (364,853) and in 1948 (363,014). In 1941 the total reported was 191,306, and in 1950, the last year for which a report is available, the total was 304,066.

FOREIGN

Symposium on the Suprarenal Cortex.—The Colton Research Society and the University of Bristol will present a symposium on the suprarenal cortex March 31-April 4 in Bristol, England. The approximate cost will be £5. Guest speakers and their subjects are as follows:

Harry J. Robinson, Rahway, N. J., Role of the Adrenal Glands in infection and Intoxication.

Hudson Hoagland, Ph.D., Shrewsbury, Mass., Adrenal Steroids and Personality Disorders.

Choh R. Li, Ph.D., Berkeley, Calif., Preparation and Assay of ACTH.

Dwight J. Ingle, Ph.D., Kalamazoo, Mich., Role of the Adrenal Cortex in Homeostasis.

George W Thorn, Boston, Clinical Applications of ACTH and Steroid Hormones.

F. Verzar, Basel, Switzerland, Nature of Adrenal Cortical Secretion.

Guy F. Marrian, F.R.S., Edinburgh, Metabolism of the Adrenocortical Steroids.

Solly Zuckerman, F.R.S., Birmingham, England, Suprarenal Cortex and the Gonads.

C. R. Broster, F.R.C.S., London, Surgery of the Suprarenal Gland with Especial Reference to the Cortex.

Gordon R. Cameron, F.R.S., London, ACTH, Steroid Hormones and Tissue Changes.

Marthe Vogt, Edinburgh, Control of the Secretory Activity of the Suprarenal Cortex with Special Reference to the Isolated Preparation.

C. J. O. R. Morris, London, ACTH Fractions and Their Mode of Action on the Suprarenal Cortex.

Frank G. Young, F.R.C.S., Cambridge, Physical and Chemical Properties of ACTH.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

ARIZONA:* *Examination.* Phoenix, Jan. 19. *Reciprocity.* Phoenix, Jan. 15-17. Sec., Dr. J. H. Patterson, 316 W. McDowell Road, Phoenix.

ARKANSAS:* *Regular.* Little Rock, June 5-6. Sec., Dr. Joe Verser, Harrisburg. *Eclectic.* Little Rock, June 5-6. Sec., Dr. Frank C. Smith, 2301 Broadway, Little Rock.

CALIFORNIA: *Written.* Los Angeles, Feb. 18-21; San Francisco, June 23-26; Los Angeles, Aug. 18-21; Sacramento, Oct. 20-23. Application must be received at least two weeks prior to date of examination. *Oral for Reciprocity Applicants.* Los Angeles, Jan. 12; Los Angeles, Feb. 16; San Francisco, June 21; Los Angeles, Aug. 16; San Francisco, Nov. 8. Applicants are requested not to arrange to come to an oral examination until they receive notice from the Credentials Committee. *Oral and Clinical for Foreign Medical School Graduates.* Los Angeles, Feb. 17; San Francisco, June 22; Los Angeles, Aug. 17; San Francisco, Nov. 9. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

COLORADO:* *Examination.* Denver, Jan. 9-11. Final date for filing application is Dec. 10. Sec., Dr. Samuel H. Brown, 831 Republic Bldg., Denver 2.

CONNECTICUT:* *Regular Examination.* Hartford, March 11-12. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic Examination.* Derby, March 11. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, Jan. 8-10. *Endorsement.* Dover, Jan. 17. Sec., Dr. J. S. McDaniel, 229 South State St., Dover.

GEORGIA: Atlanta and Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capital, Atlanta 3.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John K. Battenfield, Agana.

HAWAII: *Examination.* Honolulu, Jan. 14-17. Final date for filing application is Dec. 14. Sec., I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, Jan. 7-9. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLINOIS: Chicago, Jan. 22-24. Supt. of Regis., Mr. Charles F. Kervin, Capitol Bldg., Springfield.

INDIANA: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis 4.

MAINE: Portland, March 11-12. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: *Examination.* Boston, Jan. 15-18. Sec., Dr. Robert C. Cochrane, Room 37 State House, Boston.

MICHIGAN:* *Examination.* June. Sec., Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MINNESOTA:* Minneapolis, Jan. 15-17. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSOURI: *Examination.* Jefferson City, Feb. 19-21. *Reciprocity.* Jefferson City, Feb. 11. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 1. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEVADA:* Carson City, Feb. 4. Sec., Dr. George H. Ross, 112 Curry St., Carson City.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Dr. John S. Wheeler, State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 17-19. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO:* Santa Fe, April 7-8. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

NEW YORK: *Examination.* Albany, Buffalo, New York City and Syracuse, Feb. 5-8. Sec., Dr. Jacob L. Lochner, Jr., 23 S. Pearl St., Albany.

NORTH CAROLINA: *Endorsement.* Raleigh, Jan. 21. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. C. J. Glaspel, Grafton.

OKLAHOMA:* *Examination.* Oklahoma City, June 4-5. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination.* Portland, Jan. 3-5. *Reciprocity.* Portland, Jan. 11-12. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan 22-25. Acting Sec., Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

PUERTO RICO: *Examination.* San Juan, March 4. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

RHODE ISLAND:* Providence, Jan. 3-4. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Reciprocity.* Columbia, Jan. 7. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* *Examination.* Sioux Falls, Jan. 15-16. Ex. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

VERMONT: Burlington, Jan. 31-Feb. 2. Sec., Dr. F. J. Lawliss, Richford.

WASHINGTON:* *Examination.* Seattle, Jan. 7-9. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WEST VIRGINIA: *Examination.* Charleston, Jan. 7-9. Sec., Dr. N. H. Dyer, Capitol Bldg., Charleston 5.

WISCONSIN:* Madison, Jan. 8-10. Sec., Dr. A. G. Koehler, River Falls.

WYOMING: Cheyenne, Feb. 4. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

COLORADO: Denver, March 5-6. *Examination.* Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: New Haven, Feb. 8. *Examination.* Miss Mary G. Reynolds, Executive Assistant, State Board of Healing Arts, 110 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA: *Examination.* Washington, April 21-22. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington, D. C.

FLORIDA: Gainesville, June 7. *Examination.* Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

IOWA: Des Moines, Jan. 8. *Examination.* Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MICHIGAN: Detroit and Ann Arbor, Jan. 11-12. *Examination.* Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

MINNESOTA: *Examination.* Minneapolis, Jan. 8-9. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Omaha, Jan. 8-9. Director, Bureau of Examining Boards, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEVADA: Reno, Jan. 8. *Examination.* Sec., Mr. Frank Richardson, University of Nevada, Reno.

OKLAHOMA: *Examination.* Oklahoma, April 14. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

RHODE ISLAND: Providence, Feb. 13. *Examination.* Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TEXAS: Austin, April. *Examination.* Sec., Bro. Raphael Wilson, 306 Nalle Bldg., Austin.

WASHINGTON: *Examination.* Seattle, Jan. 2-3. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

* Basic Science Certificate required.

MEETINGS

AMERICAN COLLEGE OF CLINIC ADMINISTRATORS, Conrad Hilton Hotel, Chicago, Jan. 13-15. Dr. R. J. Wilkinson Jr., 1115 Sixth Avenue, Huntington, W. Va., President.

AMERICAN COLLEGE OF RADIOLOGY, Palmer House, Chicago, Feb. 8. Mr. William E. Stronach, 20 N. Wacker Drive, Chicago 6, Executive Secretary.

AMERICAN SOCIETY FOR SURGERY OF THE HAND, Palmer House, Chicago, Jan. 25-26. Dr. J. H. Boyes, 1401 S. Hope St., Los Angeles 15, Secretary.

ANNUAL CONGRESS ON INDUSTRIAL HEALTH, William Penn Hotel, Pittsburgh, Jan. 18-19. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE, Palmer House, Chicago, Feb. 11-12. Dr. Donald G. Anderson, 535 N. Dearborn St., Chicago 10, Secretary.

INTERNATIONAL MEDICAL ASSEMBLY OF SOUTHWEST TEXAS, Municipal Auditorium, San Antonio, Jan. 22-24. Dr. John J. Hinchey, P. O. Box 2445, San Antonio 6, Secretary.

NATIONAL CONFERENCE ON MEDICAL SERVICE, Palmer House, Chicago, Feb. 10. Dr. Harlan A. English, 139 North Vermilion St., Danville, Ill., Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:
Birmingham, Ala., The Tutwiler, Jan. 10-12. Dr. James M. Mason III, 1023 South 20th St., Birmingham, Chairman.
Panama City, R. P., El Panama, Jan. 16-18. Dr. Jaime De la Guardia, Box 808, Panama City, R. P., Chairman.
Dallas, Texas, Hotel Adolphus, Feb. 4-6. Dr. John V. Goode, 2618 Oak Lawn Ave., Dallas 4, Chairman.
Atlantic City, N. J., Chalfonte-Haddon Hall, Feb. 11-12. Dr. David B. Allman, 104 St. Charles Place, Atlantic City, Chairman.
Quebec, Can., Chateau Frontenac, Feb. 18-19. Dr. Paul A. Poliquin, 71 St. Ann St., Quebec, Can., Chairman.

SOUTHERN SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, Atlanta, Ga., Jan. 14. Dr. Lester A. Brown, 490 Peachtree St. N.E., Atlanta 3, Ga., Vice President.

TRI-STATES MEDICAL ASSOCIATION OF THE CAROLINAS AND VIRGINIA, Roanoke, Va., Feb. 18-19. Dr. James N. Northington, 306 North Tryon St., Charlotte 2, N. C., Secretary.

INTERNATIONAL

AUSTRALASIAN MEDICAL CONGRESS, Melbourne Victoria, Australia, Aug. 22-30. Dr. C. H. Dickson, Medical Society Hall, 426 Albert St., East Melbourne, Victoria, Australia, Hon. General Secretary.

COMMONWEALTH AND EMPIRE HEALTH AND TUBERCULOSIS CONFERENCE, Central Hall, London, England, July 8-13. Dr. J. H. Harley Williams, Tavistock House North, Tavistock Sq., London, W.C.1, England, Secretary General.

CONGRESS OF THE INTERNATIONAL DIABETES FEDERATION, Leyden, Netherlands, July 7-12. Dr. F. Gerritzen, 33. Prinsegracht, The Hague, Netherlands, Secretary.

EUROPEAN SOCIETY OF CARDIOVASCULAR SURGERY, Strasbourg, France, Oct. 3-4. Sir James Learmonth, Department of Surgery, University New Buildings, Edinburgh 8, Scotland.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Mexico City, Mexico, Nov. 2-6 Dr. Guido Torres Martinez, Marsella No. 11, Mexico, D.F., Secretary-General.

INTERNATIONAL COLLEGE OF SURGEONS, Madrid, Spain, May 20-24. Dr. Max Thorek, 850 West Irving Park Road, Chicago, Ill., U. S. A., Secretary-General.

INTERNATIONAL CONFERENCE ON VITAMINS AND METABOLISM, Havana, Cuba, Jan. 25. Dr. Angel Vieta Barahona, Medical School, University of Havana, Havana, Cuba, General Chairman.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Friends House, London, N.W.1, Eng. Sept. 15-18. Sir Harold Boldero, 12 Pall Mall East, London, S.W.1, England, Secretary.

INTERNATIONAL CONGRESS ON NEUROPATHOLOGY, Rome, Italy, Sept. 8-13. Dr. Armando Ferraro, 722 W. 168th St., New York, N. Y., U. S. A., Secretary General.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2. England, Hon. Secretary.

LATIN AMERICAN CONGRESS OF PHYSICAL MEDICINE, Panama City, R. P., Feb. 24-29. Dr. Cassius Lopez de Victoria, 176 East 71st St., New York, N. Y., U. S. A., Executive Director.

NEURORADIOLOGIC SYMPOSIUM, Stockholm, Sweden, Sept. 17-20. Docent Ake Lindbom, Symposium Neuroradiologicum, Serafimerlasarettet, Stockholm K., Sweden, Secretary.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Mexico City, Mexico, Jan 6-12. Dr. Luis Sanchez Bulnes, Gomez Farias 19, Mexico 4, D.F., Secretary-General.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, Havana, Cuba, Jan. 20-24. Dr. Pedro Hernandez Gonzalo, 8 No. 358, Vedado, Havana, Cuba, General Secretary.

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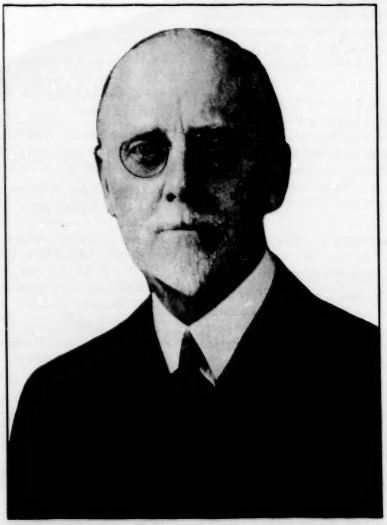
DEATHS

Cramp, Arthur Joseph ⊕ Hendersonville, N. C., director of the Bureau of Investigation of the American Medical Association from December 1, 1906 to December 1, 1935, died in Patton Memorial Hospital November 25, aged 79, of arteriosclerosis and uremia. Dr. Cramp was born in London, England, September 10, 1872. He came to the United States about 1891 and taught science in high schools in Milwaukee. Later he became an assistant in chemistry at the Wisconsin College of Physicians and Surgeons, where he received his degree in medicine in 1906. After a brief period of general practice, Dr. Cramp joined the editorial staff of THE JOURNAL and soon developed what was first known as the Propaganda for Reform Department, now known as the Bureau of Investigation. He was an Associate Fellow of the American Medical Association, a member of the Indiana State Medical Association, Society of Medical History of Chicago, Institute of Medicine of Chicago, Royal Institute of Public Health, Chicago Ornithology Society, Phi Rho Sigma, and Chicago Literary Club. Dr. Cramp compiled and edited three volumes of "Nostrums and Quackery." He was a prolific and constant contributor to THE JOURNAL, and a pioneer in the fight against quackery and fraud in the healing arts.



ARTHUR JOSEPH CRAMP, M.D., 1872-1951

Randall, Alexander, Philadelphia; born in Annapolis, Md., April 18, 1883; Johns Hopkins University School of Medicine, Baltimore, 1907; formerly professor of urology and assistant and associate professor of surgery at the University of Pennsylvania School of Medicine; specialist certified by the American Board of Urology; member and past president of the American Association of Genito-Urinary Surgeons; member, formerly secretary, and past president of the American Urological Association; member of the Clinical Society of Genito-Urinary Surgeons; fellow of the American College of Surgeons; affiliated with the Hospital of the University of Pennsylvania and Abington (Pa.) and Chestnut Hill hospitals; served in World War I; wrote "Surgical Pathology of Prostatic Obstruction"; died November 18, aged 68, of cerebral hemorrhage.

Adcock, John Harold, Chicago; University of Louisville (Ky.) Medical Department, 1901; died in Michael Reese Hospital November 21, aged 72, of bronchopneumonia.

Beirne, Henry Peter, Quincy, Ill.; University of Vermont College of Medicine, Burlington, 1893; member of the American Medical Association and from 1921 to 1925 a member of its House of Delegates; past president of the Adams County Medical Society; served as councilor of the Sixth District of the Illinois State Medical Society; served as a member of the state board of medical examiners; at one time served the city as alderman; died in St. Mary's Hospital October 30, aged 79, of bronchopneumonia.

Broaddus, John Garnett ⊕ Bowling Green, Va.; University College of Medicine, Richmond, 1905; died September 19, aged 70.

Campbell, Lee Douglas, New Richmond, Wis.; Northwestern University Medical School, Chicago, 1940; member of the American Medical Association; president of the Pierce-St. Croix Counties Medical Society; served in the regular Navy and during World War II; on the staff of the Holy Family Hospital; died in Evanston, Wyo., in a train accident November 12, aged 38.

Chipman, Nettie Genevieve, Savanna, Ill.; Chicago College of Medicine and Surgery, 1915; past president of the Carroll County Medical Society; served during World War I; formerly on the staff of the Deaconess Hospital in Freeport; died October 19, aged 78, of injuries received in a fall.

Christeson, Edgar Lee, Los Angeles; St. Louis University School of Medicine, 1922; member of the American Medical Association; died in Queen of Angels Hospital September 25, aged 59, of duodenal ulcer and carcinoma.

Coen, Walter William ⊕ Chicago; Chicago College of Medicine and Surgery, 1916; member of the International College of Surgeons; died in Memorial Hospital, Springfield, November 5, aged 59, of hypertensive cardiovascular disease.

Crawford, William G. ⊕ Terre Haute, Ind.; Indiana University School of Medicine, Indianapolis, 1908; fellow of the American College of Physicians; member of the American College of Chest Physicians; died in Wesley Memorial Hospital, Chicago, November 6, aged 68, of arteriosclerotic heart disease.

Denzer, Bernard Solomon, Shelton, Conn.; Johns Hopkins University School of Medicine, Baltimore, 1910; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; served on the staffs of Mount Sinai and Bronx hospitals in New York; died November 15, aged 65, of cerebral embolism.

Fisher, James Tucker, Los Angeles; Harvard Medical School, Boston, 1896; died in the Veterans Administration Center, West Los Angeles, September 1, aged 86, of arteriosclerosis.

Gashwiler, John Schooling, Novinger, Mo.; Medico-Chirurgical College of Kansas City, 1900; member of the American Medical Association; member and past president of the board of education of Novinger; died October 4, aged 73, of coronary thrombosis.

Grossman, Abraham ⊕ New York; Fordham University School of Medicine, New York, 1918; an Associate Fellow of the American Medical Association; served during World War I; received the Selective Service Medal from Congress during World War II for his voluntary services with the local draft board; died November 3, aged 60, of carcinoma.

Jackson, Wycliffe Charles, Amelia, Va.; Medical College of Virginia, Richmond, 1928; member of the American Medical Association; died September 17, aged 47, of tuberculosis.

Janney, Francis Rush ⊕ Wauwatosa, Wis.; Northwestern University Medical School, Chicago, 1921; clinical professor of pediatrics and director of the department at Marquette University School of Medicine; specialist certified by the American

⊕ Indicates Fellow of the American Medical Association.

Board of Pediatrics; member of the American Academy of Pediatrics; served during World War I; for many years on the staff of Children's Hospital; died October 21, aged 57, of carcinoma of the larynx.

Kerr, Johnston Harper ✙ Akron, Iowa; University of Nebraska College of Medicine, Omaha, 1904; served overseas during World War I; past president of the Plymouth County Medical Society and Sioux Valley Medical Association; on the visiting staff of Dakota Hospital in Vermillion, S. D., and Mercy Hospital in LeMars; owner and director of the Akron Hospital from 1920 to 1951; died in the Akron Community Hospital October 1, aged 75, of coronary occlusion.

Long, Frederick, San Francisco; University of California Medical School, San Francisco, 1910; member of the American Medical Association; member of the city board of health; died in Franklin Hospital October 19, aged 68, of cerebral hemorrhage.

Lyons, Harry Eugene ✙ Erie, Pa.; University of Buffalo School of Medicine, 1909; served during World War I; for nine years a member of the city board of health; affiliated with St. Vincent's Hospital, where he died October 4, aged 67, of arteriosclerotic heart disease.

Morgenstern, James A., Easton, Pa.; College of Physicians and Surgeons, Baltimore, 1907; member of the American Medical Association; school examining physician; on the courtesy staff of Easton Hospital, where he died September 5, aged 70, of chronic myocarditis.

Morman, William Daniel ✙ St. Louis; Howard University College of Medicine, Washington, D. C., 1929; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; instructor, department of otolaryngology, St. Louis University School of Medicine; affiliated with St. Mary's Infirmary, People's Hospital, and the Homer G. Phillips Hospital, where he died October 9, aged 49.

Parris, Briggs, Geraldine, Ala.; University of Tennessee College of Medicine, Memphis, 1913; member of the American Medical Association; died recently, aged 65, of a heart attack.

Reichelderfer, Vest Dresbach ✙ Amanda, Ohio; Starling-Ohio Medical College, Columbus, 1913; served during World War I; affiliated with Lancaster-Fairfield County Joint Hospital in Lancaster, where he died September 28, aged 60, of coronary disease.

Rohm, Uriah Franklin, Carnegie, Pa.; Medico-Chirurgical College of Philadelphia, 1902; member of the American Medical Association; on the visiting staff of Western Pennsylvania Hospital in Pittsburgh; died November 3, aged 75, of coronary occlusion.

Savage, William Elliott, Portland, Ore.; Harvard Medical School, Boston, 1920; killed November 7, aged 58, in an automobile accident.

Schneider, Louis ✙ Newark, N. J.; Medico-Chirurgical College of Philadelphia, 1908; past president of the Essex County Medical Society; on the staff of Presbyterian Hospital, where he died November 6, aged 67, of cerebral hemorrhage, arteriosclerosis, myocarditis and diabetes mellitus.

Schwerer, Herman Mayes ✙ Canton, Ill.; University of Illinois College of Medicine, Chicago, 1934; past president of the Fulton County Medical Society; affiliated with Graham Hospital; died October 13, aged 44, of coronary thrombosis.

Seale, Enoch Carruth, Prescott, Ariz.; Vanderbilt University School of Medicine, Nashville, Tenn., 1916; mayor of Prescott; served during World War I; at one time associated with the U. S. Public Health Service Reserve, resigning from the U. S. Veterans Hospital in Whipple in 1923; died October 11, aged 63, of coronary disease.

Sheehan, Katharine Cecelia, Salem, Mass.; Tufts College Medical School, Boston, 1908; member of the American Medical Association; for many years school physician; died October 21, aged 78.

Shepler, Joseph Robert ✙ Doylestown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1935; served during World War II; died in Abington (Pa.) Memorial Hospital November 7, aged 43, of cerebral hemorrhage.

Simons, Irving ✙ New York; Columbia University College of Physicians and Surgeons, New York, 1908; member of the American Urological Association; served during World War I; affiliated with Mount Sinai, Montefiore, and New York hospitals and the Hospital for Joint Diseases; died in Mount Vernon, N. Y., November 10, aged 67, of cerebral hemorrhage.

Smith, George Henry Jr., Brooklyn; Long Island College Hospital, Brooklyn, 1898; member of the American Medical Association; on the associate staff of Prospect Heights Hospital; died recently, aged 75, of heart disease.

Smith, Thomas Jefferson, Meridian, Miss.; Atlanta School of Medicine, 1911; died September 4, aged 66.

Stacey, John Wallace ✙ Tucson, Ariz.; University of Manitoba Faculty of Medicine, Winnipeg, Man., Canada, 1925; member of the American College of Chest Physicians; served during World War II; died in St. Mary's Hospital November 11, aged 50, of brain tumor.

Stegner, Adam, Wyoming, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; died November 7, aged 82, of coronary thrombosis.

Stella, Giovanni ✙ New Rochelle, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1906; died October 30, aged 66, of coronary thrombosis.

Stevenson, Alexander Montgomery, Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1895; died in Atlantic City Hospital October 24, aged 87, of intertrochanteric fracture of the right hip.

Stoever, Harry Von H., La Jolla, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; died October 3, aged 82, of cerebral hemorrhage.

Strange, John William ✙ Loogootee, Ind.; Medical College of Indiana, Indianapolis, 1903; served as county coroner and as mayor of Loogootee, for many years secretary of the county board of health; affiliated with Daviess County Hospital in Washington; in September, 1950, was chosen "General Practitioner of the Year" for the state of Indiana, by the Indiana State Medical Association; vice-president and a director of the Union Bank; died October 15, aged 75, of coronary occlusion.

Strawn, Estil Young, St. Joseph, Mo.; Howard University College of Medicine, Washington, D. C., 1913; served during World War I; died October 5, aged 64.

Sugg, Herbert Reid ✙ Clinton, Iowa; Rush Medical College Chicago, 1896; past president of the Iowa State Department of Health; an Associate Fellow of the American Medical Association; died October 18, aged 77, of chronic myocarditis and hypertension.

Swart, Dennis S. ✙ Portland, Ore.; University of Oregon Medical School, Portland, 1918; died October 31, aged 62, of a heart attack.

Talley, William Warren, New York; Medical College of Virginia, Richmond, 1887; College of Physicians and Surgeons, medical department of Columbia College, New York, 1888; formerly chief of the division of communicable diseases with the city health department; died in Richmond, Va., November 12, aged 87, of carcinoma of the lung.

Taylor, David Torrens, Abington, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; died October 27, aged 78, of coronary thrombosis.

Taylor, John Thomas, Cottonwood, Ariz.; Barnes Medical College, St. Louis, 1902; died in Prescott October 13, aged 74, of uremia.

Waddell, William Edgar ✙ Lexington, Va.; University of Virginia Department of Medicine, Charlottesville, 1934; served during World War II and was awarded the Silver Star, Purple Heart, and Bronze Arrowhead; specialist certified by the American Board of Surgery; died October 7, aged 41, of bronchogenic-carcinoma.

Weinstein, Henry, New York; Cornell University Medical College, New York, 1907; died in Lebanon Hospital July 18, aged 67, of coronary thrombosis.

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FOREIGN LETTERS

ITALY

Meeting of Ionian Medical Society.—The Ionian Society of Physicians and Surgeons held a meeting in Taranto, at which Professor Natale discussed the tonsillectomy problem. He alluded to the functional prerogatives of the tonsil (hemodynamic, protective, and endocrine) and concluded that, despite the many difficulties that accompany surgical intervention, tonsillectomy remains a therapeutic method that has no substitute, especially when the lesion has become so chronic that the organ does not fulfill its functional requirements.

Professor Buonsanti, the chairman of the meeting, discussed major traumatic dislocations. His 17 years of experience in the City Hospital of Taranto led to the following observations.

1. Major traumatic dislocations, i. e., those involving the hip, the shoulder, and the elbow, represent only 1.16% of the traumatic lesions that he observed. Dislocations of the shoulder are the commonest (0.72%), followed by those of the elbow (0.33%); less numerous are those of the hip (0.11%).

2. Traumatic dislocations of the hip and of the elbow are determined by leverage, while that of the shoulder is determined by direct trauma.

3. A dislocation without complications presupposes conservation of the muscle tone; to its interplay of action and counterreaction is due the displacement of the head of the bone from the cavity in which it articulates.

4. Traumatic dislocations of the hip, in the cases observed, were predominant in infants, which conflicts with general statistics.

5. In the cases under observation there were no nervous or vascular complications.

6. The reduction of the dislocation should be performed gently, with inverse leverage, but also, when it is possible, as in superficial joints, one should aid with propulsion the return of the dislocated head of the bone. Every reduction should be performed with the patient under anesthesia, so that complete muscle relaxation is obtained.

7. Unless muscle tone has been abolished by violent trauma, a second dislocation is rare; therefore, caution against prompt use of the joint is unnecessary. The patient should use the joint when the pain has completely disappeared. Immobilizing bandages are not necessary and prevent the restoration of the natural muscle tone, which is very useful for the functional articular restoration.

Congenital Cardiopathy and Surgical Interventions.—Prof. Vittorio Puddu, director of the rheumatism and heart disease center at the University of Rome, lectured to the Filippo Pacini Medical Academy of Pistoia on clinical diagnosis of congenital cardiopathy with regard to surgical indications. The application of surgery in congenital heart disease, said the speaker, has made necessary for the general practitioner a more thorough cognizance of these morbid entities from the anatomic, physiopathological, and diagnostic points of view with regard to indications for surgical intervention. Some congenital heart diseases, for example, stenosis of the aortic isthmus, aortic stenosis at its onset, persistence of the ductus arteriosus, and Roger's disease (localized ventricular septal defect), present a relatively easy clinical diagnosis, because characteristic symptomatic factors are present. In these instances it is also easy to determine in each case whether an indication for surgical intervention is present. In other instances, and especially in forms of cyanosis, a diagnosis is difficult and often requires the use of special laboratory investigations, for example, cardiac catheterization, angiography, and oximetry. In many cases, however, a good clinical examination, supported by other investigations, such as determination of circulation time and the roentgenologic examination, helps to formulate an exact diagnosis or at least to establish whether a surgical intervention is feasible. Working in this way the practitioner will be very useful to the patient, especially to the one who lives far from specialized medical centers.

Congenital Familial Icterus.—At a meeting of the Medicosurgical Society of Pisa, held under the chairmanship of Professor Cassano, Dr. Conti and Dr. Luciani described a rare form of chronic familial icterus, characterized by hepatosplenomegaly, hyperbilirubinemia, increase of the hemoglobic catabolism, and hypercholesteremia. The disease occurred in the parents and two sons. The symptomatic picture was more pronounced in the mother and the sons, while in the father signs of liver and spleen disturbances were not observed, and only a high amount of cholesterol was present in the blood. The essentially hemolytic nature of the icteric picture in these patients was confirmed by all the clinical and laboratory data. Hypercholesteremia, observed in all the members of the family, was characterized by a high index of esterification and was typically constitutional, familial, and hereditary; it was neither of exogenous origin nor linked with an eventual dyshepatia.

According to the speakers, in these patients the hemolytic diathesis was associated with hypercholesteremic diathesis. Usually a syndrome of excessive escape of hemoglobin is associated with low levels of cholesterol in the circulating blood.

SWEDEN

Claims for Legal Induction of Abortion.—Since the second quarter of 1948, there has been an official organization in Stockholm for giving advice on sex problems to the public. Serving on this body are a gynecologist, a psychiatrist, two full-time curators or social workers, and a secretarial staff. One of the curators, Karin Malmfors, has recently undertaken a personal follow-up investigation of 200 women who applied to this organization for the purpose of seeking legal induction of abortion. These women represented a fair sample of the applicants, as consecutive, unselected cases were studied, with the exception of women in whom abortion was induced for eugenic reasons, who were not included in this study. Seventy per cent of the women were married, 21% were unmarried, and 7% were divorced, and 2% were widows. The married women were much older than the unmarried women. Sixty were persuaded to allow the pregnancy to go to term; 97 had legal abortions (being carried out only in 84 cases); 31 were refused abortion; 7 aborted spontaneously; and 5 resorted to criminal abortion.

As a part of this study, Karin Malmfors visited the women in their homes and discussed their reactions in a friendly, informal way. Although there were 39 (32 married and 7 living alone) who expressed satisfaction with the induction of abortion, there were 45 who suffered from a sense of guilt or deterioration of mental status. In the latter group, there were 10 women with symptoms of such disturbances as anxiety neuroses. In 75% of the patients, housing problems played a predominant role in the wish for the induction of abortion. Another significant result of this study was the disclosure of the high proportion of cases in which official consent for abortion either was not put into practice or was followed by regret and guilt. In her office work and during her conversations with women in their own homes, Karin Malmfors was frequently impressed by the slight value attached to human life by both the community as a whole and the individual. Weighing decisively in the balance between life and death may be such apparently trifling factors as warm clothing or a few weeks' rest for a worn-out mother.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Sketches and Caricatures of Scandinavian Physicians.—Several years ago, the conglomerate Scandinavian medical journal *Nordisk Medicin* entertained its readers with a series of caricatures of well-known physicians in the Scandinavian countries. Most of these sketches were the work of Dr. M. Strandqvist and Dr. G. Østerberg, whose victims must have experienced mixed feelings on seeing themselves as others see them. They were for the most part well-known leaders of the medical profession, men of mature years. Many of them have gone into retirement and have been succeeded by a new generation of teachers and professors, who must now stand the acid test of caricature. The editors of *Nordisk Medicin* proposes to begin their new portrait gallery in 1952 with a series of sketches to appear on the last page of each issue.

COLOMBIA

Repression of Prostitution.—In Colombia, except in Bogotá, prostitution has been tolerated under regulation. Prostitution was suppressed in Bogotá in 1949, when municipal law No. 95 was enforced. It was recently stated that suppression of prostitution in Bogotá has resulted in an increase in sexual delinquency. The Society of Cultural Improvement and Social Work requested the opinion of the members of the National Academy of Medicine, and for several weeks a scientific committee discussed the subject. The conclusions of the committee were approved by the members of the academy, and were then given, in answer, to the Society of Social Work by Drs. Jorge Bejarano and Jorge E. Cavelier who represented the academy. The following conclusions were reached.

1. The National Academy of Medicine considers the municipal law repressing prostitution in Bogotá worthy of respect and of approval. 2. The members of the academy discussed the economic, social, and moral violations that prostitution constitutes and voted that the government should pass laws to repress prostitution throughout the country. 3. By reviewing the municipal law that repressed prostitution in Bogotá and the different systems that have been used through the years in all countries for controlling and regulating prostitution, the members found that repression of prostitution is the only measure to use against this evil. Repression is based on principles of hygiene and on social and Christian doctrines. The statements recently made by some persons about the bad results of repression are false, as shown by data reviewed by the academy. Bad results, if any, could be attributed only to the manner in which the law is applied. 5. The members of the academy believe that the municipal law No. 95 should be enforced by the local health authorities. This measure will prevent violation of the law, which should remain in force. 6. The members of the academy are requesting from the Ministry of Hygiene the creation and appointment of a permanent committee on the subject. This committee could prepare a law for repression of prostitution in the entire country. The function of this permanent committee would be to explain the principles and aims of the law whenever doubts or criticisms are expressed to the members. The permanent committee could carry on campaigns for the education of the people on sex problems and for control of venereal diseases, and should discover the causes of and the remedies for prostitution. 7. The members of the National Academy of Medicine cordially invite the national scientific societies, the press, the clergy, and the newspaper syndicates to support and cooperate with the government for the success of the campaign against prostitution. 8. In regard to prostitution, it is a great error for a nation to retain old systems that are conflicting with sanitation and with morality. The morality and health of the people is a responsibility of the government. Tolerance and regulation of prostitution by the government result in masking this social vice for the unscrupulous.

Institute of Legal Medicine.—Aug. 24, 1951, marked the third anniversary of the opening of this institute, which is among the best in South America. Dr. G. Uribe Cualla, professor of legal medicine in the Javeriana and the national universities and author of many books on the subject is the director. The Institute of Legal Medicine was created by the government as a center for consultation and decision on all medicolegal affairs in the country. It was created to replace the old Central Office of Legal Medicine. According to the laws, this institute is the central unity of all the national departments of legal medicine having also control on judicial matters and functions in cooperating with the teaching of legal medicine in the faculties of medicine and of law of the University of Bogotá. The 15 national departments of legal medicine with their personnel are dependencies of the institute, which has the following functions: To solve all medicolegal problems for all the departments of the country and to serve as consultant for the supreme court of claims as well as for judicial matters in the courts of Cundinamarca. The scientific personnel and other workers are selected by examination in accordance with the regulations of the ministry of justice. The cornerstone for the Institute of Legal Medicine was placed on June 12, 1943. The institute was opened on Aug. 24, 1948, coincidently with the celebration of the first National Congress of Legal Medicine. The institute provides, at the request of the judicial authorities, assistance and arbitration, such as intervention in cases of personal lesion, autopsy in cases of sudden death without medical certification, judgment in sex delinquency, abortion, age calculations, traffic accidents, industrial accidents (cases of controversy), and psychiatric examination of persons for placement in national asylums for the insane. A total number of 317,819 negotiations on legal medicine have been carried on by the proper departments in the last 15 years. The institute includes the following facilities: amphitheater of legal medicine (about 1,000 necropsies a year), laboratory of toxicology (200 analyses a year), forensic laboratory (2,500 analyses a year), laboratory of radiology (613 roentgenograms a year), and laboratory of pathologic anatomy (300 protocol studies a year). *Revista de Medicina Legal* is the organ of the institute. Publication started in 1935, and 62 issues have thus far been published. It includes the work carried on by the national societies of psychopathology, neurology, and legal medicine. Dr. G. Uribe Cualla is the president of the Colombian Society of Legal Medicine.

Congress of Otorhinolaryngology and Ophthalmology.—The second National Congress of Otorhinolaryngology and Ophthalmology convened in Medellín Aug. 8-11, 1951, under the chairmanship of Dr. C. J. Vásquez C. of Bogotá. The Congress was held under the auspices of the Faculty of Medicine of Medellín and the Academy of Medicine of Antioquia. Official speakers were as follows: C. Uribe Aguirre ("Tensional Relations Between Humeral and Central Retinal Arteries"), J. Suárez Hoyos ("Tonsillectomy and Its Indications in Children"), F. Arango Jaramillo ("Commentaries on Strabismus"), M. Barrientos ("Commentaries on Petromastoid Emptying"), A. Llano ("Technic of Pterigium"), H. García Gómez ("Commentaries on Clinical Cases of Cataract"), J. Arciniegas ("Focal Infection"), C. Vásquez C. ("Cancer of the Mouth"), H. Londoño Vélez ("Tuberculinotherapy"), P. E. Mendoza ("Some Cases of Cyclodiathermy"), A. Posada ("Analysis of Some Cases of Retinal Detachment"), H. Arellano Angel ("Experimental Surgery on the Cornea in Animals"), A. P. Rodríguez Pérez ("Functional Significance of Amacrine Cells"), C. Vásquez C. and A. P. Rodríguez Pérez ("Experimental Cataract: Histologic Study"), C. Vásquez, S. Castaño, and A. P. Rodríguez Pérez ("Biomicroscopy and Histologic Texture of the Vitreum"), A. Estrada ("Goniotomy"), and A. Sanchez ("Sympathectomy in Optic Atrophy").

Deaths.—Dr. Julio Zuluaga, dean of the Faculty of Medicine of Caldas City, died from cancer of the lung, on Oct. 1, 1951, in Manizales City. He was born in Salamina, obtained his medical degree from the Faculty of Medicine of the University of Colombia, and carried on postgraduate studies, in surgery, in the United States and France. He was the founder of the Society of Medicine and Surgery of Manizales and of a private clinic in the same city. The Department of Roentgenology in his clinic was the first established in the city. He established the charity departments in the Caldas Hospital and the sanatorium for tuberculous patients in that city. He was a deputy in the House of Representatives and head of the Municipalities of the cities of Caldas and of Manizales.

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CORRESPONDENCE

PITUITARY DWARFISM

To the Editor:—The report in THE JOURNAL of Nov. 17, 1951, by James A. Greene, entitled "Pituitary Dwarfism," presented conclusions which must be considered controversial in the light of our present knowledge of growth mechanisms and the role of the pituitary gland. The growth-promoting properties of a "pituitary extract" (origin, potency, and other pertinent factors unstated) used in these studies have never before been duplicated in humans to my knowledge. Results in the treatment of dwarfism secondary to hypopituitarism with pure crystalline somatotropin have been uniformly discouraging. Lewis, Klein, and Wilkins (*J. Clin. Invest.* **29:**460 [April] 1950) failed to obtain growth, weight gain, nitrogen retention, or rise in serum inorganic phosphorus in a dwarf (probably panhypopituitary) and in a cretin but did note malaise, fever, anorexia, and negative nitrogen balance. Escamilla and Bennett (*J. Clin. Endocrinol.* **11:**221 [Feb.] 1951) obtained similar results in a pituitary dwarf.

In Dr. Greene's report there was no mention of a control period of observation prior to therapy. The rate of spontaneous growth was therefore unknown. There was no record in the case protocols of the weight, nutritional status, or dietary background of the 10 patients. Talbot and his co-workers (*New England J. Med.* **236:**783 [May 22] 1947) studied a group of dwarfed children in whom subnormal caloric intake was the primary etiologic factor, and several of these children exhibited a growth spurt when well fed. The only criterion for the diagnosis of pituitary dwarfism offered here was subnormal height and retarded bone age. Talbot has clearly demonstrated retardation of skeletal maturation of a degree equal to panhypopituitarism in his "nutritional dwarfs." It would be informative for Dr. Greene to document his protocols with more detail in an addendum to further substantiate the conclusions arrived at in this interesting paper. Finally, both thyroid and testosterone, agents with growth-promoting properties, were often used simultaneously with the pituitary extract. On the basis of the evidence offered in Dr. Greene's paper, one must reserve judgment both as to the diagnosis of dwarfism of pituitary origin and to the growth-promoting properties of the pituitary extract used.

NORMAN G. SCHNEEBERG, M.D.
1834 Pine St., Philadelphia 3.

SIMPLE COMEDONE EXTRACTOR

To the Editor:—In 1946, after my return to the civilian practice of dermatology from military service, it was found that patients encountered difficulty in purchasing comedone extractors; those that were obtainable were inferior. At that time I was tempted, because of the scarcity of metal and the poor quality of the comedone extractors, to submit for publication a note suggesting the use of a substitute implement that could be used by the patient. It was simple, readily available, inexpensive, efficient, and superior to many types of comedone extractors that are sold in drug stores. The suggestion was not submitted because it was anticipated that better extractors would be made available. Five years have now elapsed, during which time the type and quality of the comedone extractors on the market have not improved. It appears that the new limitations set on the use of metals will impose further restrictions in the manufacture of better quality implements.

Where it has been necessary to recommend the removal of comedones by patients at home, I have suggested the use of an ordinary glass eyedropper of the straight narrow-tip variety. The end of the tip however, must be smooth and not sharply cut off as some are. The tip is placed directly over the blackhead, the glass permitting easy visibility in centering the comedone within the lumen of the tip, and pressure is exerted in the usual manner. The patient can readily see the comedone enter the lumen of the eyedropper thereby determining the amount of pressure to be exerted. Should the tip become plugged with expressed comedones, it is an easy matter to remove them by blowing out the collection from the wide end of the eyedropper.

I have found this simple instrument highly satisfactory. In my experience, less trauma has resulted from the use of the eyedropper than from the use of the cheap extractors, many of which have a sharp metallic rim around the hole, which frequently results in laceration of the skin.

HAROLD SHELLOW, M.D.
8 S. Michigan Ave., Chicago.

THORACENTESIS

To the Editor:—With reference to the article in THE JOURNAL (**146:**1597 [Aug. 25] 1951) entitled "Practical System for Thoracentesis Using a Blood Donor Set," by Dr. Robert D. Beech, of Salt Lake City, and to the letter concerning this article from Dr. W. B. Bergmann (**147:**990 [Nov. 3] 1951), in which he also claims priority for the procedure; I first used a vacuum bottle for thoracentesis about 35 years ago and had supposed the method to be in more or less general use. I had at that time in my office a particularly good suction pump for cleaning pipets. When this pump was attached to a 4-qt. bottle, sufficient vacuum was obtained to aspirate 3 qt. of fluid. I claim no priority for this procedure, as it was being used by others at that time at the University Hospital in Ann Arbor.

MARK MARSHALL, M.D.
918 Forest Ave., Ann Arbor, Mich.

To the Editor:—In THE JOURNAL of Nov. 3, 1951, Dr. W. B. Bergmann raises the question of priority in the use of a vacuum flask for the aspiration of pleural effusions and refers to "Practical System for Thoracentesis Using a Blood Donor Set," by Robert D. Beech (*J. A. M. A.* **146:**1597 [Aug. 25] 1951). This method was described and illustrated by us in 1946 (Penetrating Wounds of the Chest, *Ann. Surg.* **123:**363 [March] 1946). It is possible that a similar method had been described earlier, as our paper was written in the European Theater and we had little opportunity to check the current literature.

JOHN BURKE, M.D.
THEODORE T. JACOBS, M.D.
537 Delaware Ave., Buffalo 2.

ANILINE POISONING

To the Editor:—I noticed in THE JOURNAL of Sept. 8, 1951, page 198, an abstract of an article entitled "Methemoglobinemia Due to Aniline," from the *Medical Journal of Australia.* You state that "this seems to be the first case in which such poisoning was produced by the pure chemical." On Sept. 27, 1949, I sent you a paper entitled "Acute Aniline Poisoning," in which a white man, 37, working as a laborer in an industrial plant, was poisoned by pure aniline oil which had leaked from a drum on the floor. You did not feel that the report warranted acceptance. In addition, there were electrocardiograms that reverted to normal; I have not been able to find in the literature any such report.

SAMUEL M. JACOBSON, M.D.
50 Pershing St., Cumberland, Md.

GENERAL PRACTICE RESIDENCY

To the Editor:—We should like to call your attention to an error in the Sept. 29, 1951, issue of THE JOURNAL. On page 411, under item 7, which lists the general residencies approved by the Council on Medical Education and Hospitals, you indicate that R. D. McConchie is the chief of the general practice section in our hospital.

While we do have an approved general practice residency, we do not have at the present time a general practice section of our attending medical staff.

THOMAS L. NORTON, Administrator
Wichita General Hospital
Wichita Falls, Texas.

MEDICAL MOTION PICTURES

Tele-Clinic No. 3: 16 mm., black and white, sound, showing time 39 minutes. Produced in 1951 by and procurable on loan from Wyeth, Incorporated, Film Library, 1600 Arch St., Philadelphia 3.

This motion picture is a newsreel type coverage of the Thirty-Second Annual Session of the American College of Physicians, St. Louis, 1951.

The film begins with a view of the auditorium, a welcome address by the general chairman, and a statement of the objectives of the college by Dr. William S. Middleton, president. Abstracts of the following five papers are read by the authors: "Radiation Injury Following an A-Bomb Explosion," Lt. Col. C. F. Vorder Bruegge, M.C., U.S.A., Armed Forces Institute of Pathology; "Current Concepts of the Coagulation Mechanism," Dr. Kenneth N. Brinkhous, University of North Carolina School of Medicine; "Prevention of Rheumatic Fever," Dr. Charles H. Rammelkamp Jr., Western Reserve University School of Medicine; and "Iron Metabolism and the Therapy of Iron Deficiency States," Dr. Carl V. Moore, Washington University School of Medicine, and "A Biblical Introduction to Geriatric Medicine," Dr. Louis Krause, University of Maryland School of Medicine. Sequences of portions of the convocation are then shown. These include formal induction of newly elected fellows; presentation of a mastership to Dr. Ernest Irons; Sir John Parkinson of England being made an honorary fellow; presentation of the James D. Bruce Memorial Award to Dr. Rolla Dyer and the Alfred Stengel Memorial Award to Dr. George Morris Piersol; convocation address by Sir John Parkinson; and closing of the meeting by President Middleton.

This film would be of primary interest to members of the American College of Physicians. The photography and narration are satisfactory.

Extraperitoneal Caesarean Section: A Simplified Paravesical Technic: 16 mm., color, sound, showing time 17 minutes. Prepared by A. R. Abarbanel, M.D., College of Medical Evangelists and Temple Hospital, Los Angeles. Produced in 1951 by and procurable on loan, rental, or purchase from Motion Picture Division, Department of Theater Arts, University of California, Los Angeles.

This film demonstrates the relative ease and safety with which extraperitoneal cesarean section may be performed. It stresses the avoidance of trauma to the bladder and of entrance into the peritoneal cavity. The author's statements as to the indications for relative ease and safety in performing extraperitoneal cesarean section are acceptable; however, some of the modifications of previously utilized technics are not entirely new, nor do they present operative advantages over standard accepted technics. A broad downward curved incision is used because it facilitates exposure with less scar formation than the Y-shaped incision. The use of the modified Z incision in the uterus is open to question. It is stated that skin clips are of advantage; this is largely a choice of the individual operator, as interrupted sutures afford equal advantages in cases that are considered to be or are potentially infected. This film should lend itself well for presentation to medical society groups and for intern and student teaching. It is recommended for the purpose for which it is presented and is well organized from a production point of view. The photography and narration are excellent.

The Diagnosis of Surgical Lesions of the Alimentary Tract: 16 mm., black and white, sound. Produced by the U. S. Army. Procurable on loan from the Army Surgeon of the Army Area in which the request originates.

Part 1, "The Primary Examination" (showing time 20 minutes [PMF 5177A] 1950), rightfully stresses the importance of the initial examination, which must be as complete and as thorough as possible. History-taking and physical examination, including sigmoidoscopy, are presented and evaluated. The simpler laboratory facilities which are available in any doctor's office, such as for blood cell counts, urinalyses, and guaiac tests, are emphasized. In this instance a lesion of the sigmoid was suspected. The endoscopic views of the mucous membrane of the rectum and sigmoid were rather noninformative, since they lack the very necessary element of color.

Part 2, "Special Technics and Apparatus" (showing time 21 minutes [PMF 5177B] 1951), carries this case further, demonstrating the utilization of more formidable diagnostic procedures, such as fluoroscopy, roentgenography, cytologic study, and biopsy. This section of the film also illustrates the essential study of a case of achalasia of the esophagus, and another case of carcinoma of the stomach. Here, too, the endoscopic views of the esophagus were in need of color.

In general, these films demonstrate excellent planning and presentation. They rightfully stress the important role which the general practitioner plays in the early recognition of these lesions. Part 1 is recommended for the instruction of medical students and residents and as a review for general practitioners. Part 2 is recommended for the instruction of residents and interns and as a review for general practitioners.

Thrombosis and Embolism: Part I. Pathogenesis and Clinical Manifestations: 16 mm., black and white, sound, showing time 18 minutes. Produced in 1948 by Norman P. Schenker, M.D., in cooperation with the Gynecological and Obstetrical Clinic, Cantonal Hospital, Geneva, H. de Watteville, M.D., and the Department for Medical Research, F. Hoffmann-La Roche & Co., R. Jurgens, M.D. Procurable on purchase ($60.00) from Medical Film Institute of the Association of American Medical Colleges, 2 East 103rd Street, New York 29.

This Swiss film reviews the clinical manifestations of postoperative thrombosis and embolism and considers in detail the physiopathological processes underlying the disorder. This is a highly interesting and stimulating effort to incorporate into one film a great deal of factual knowledge. The sound track, particularly in the first part of the film, is poor and is therefore disturbing. The spelling of the names of certain clotting factors may be foreign to the American audience (fibrinogine and thombine). There are certain obvious errors in the text, the most important one being a repeated statement that the embolus obstructs the bronchus of the lung.

Looking at it as a whole, this film is a notable attempt to summarize in a didactic manner factual knowledge about this disease. The clinical part of the film is unfortunately too short and represents the current teaching in Europe. One might object seriously to the omission of the muscle thrombus in the calf and its clinical detection. The visualization of thrombus formation under the microscope is an excellent illustration of the clotting phenomenon and in itself is a notable contribution. This does not represent the best up-to-date thinking on this problem in this country. It should be restricted to a group of research workers who are interested in this field but not released to the general medical audiences or to medical students.

The film is well organized and the photographic quality is good.

Subtotal Gastrectomy: 16 mm., color, sound, showing time 33 minutes. Prepared by John L. Madden, M.D., St. Clare's Hospital, New York. Produced in 1951 by and procurable on rental or purchase from Sturgis-Grant Productions, 314 East 46th Street, New York 17.

This film demonstrates a subtotal gastric resection utilizing a modification of the Reichel-Polya-Balfour type of procedure. The gastrojejunal anastomosis is accomplished by using a long loop placed antecolic with an isoperistaltic anastomosis. The patient is a 56-year-old white man with a diagnosis of chronic duodenal ulcer associated with partial obstruction. The legend describing the case history is projected on the screen at the time the commentator presents his running commentary. To read and to listen to different thoughts simultaneously is confusing; either one of these presented singly would have been preferable. The preoperative and postoperative roentgenograms were presented well.

The incision is outlined but not described. It would have been helpful had the limits of the mobilization of the greater curvature been stressed. Mention was made that vascular adhesions were being severed. However, these structures appeared to be branches of the usual pancreaticoduodenal artery, which are normally situated in this position. In mobilizing the lesser curvature it would have been far better and anatomically correct had the term "right gastric artery" been used rather than simply stating that the hepatoduodenal ligament is severed. The anastomosis was well done. The film presents good technique and an adequate resection for duodenal ulcer. It can be recommended for those interested in gastric surgery. Except for a few scenes that are slightly blurred, the photography is well done.

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Charitable Hospitals: Liability for Negligence of Nurse's Aide.—The plaintiff sued for damages alleged to have been sustained as a result of the negligence of a nurse's aide employed by the defendant. From an order directing a verdict in favor of the defendant, the plaintiff appealed to the Supreme Court of Arizona.

In the early part of 1948, the plaintiff entered the defendant hospital for care and treatment of a torn sciatic nerve from which she was suffering. By February 29 of that year she had almost completely recovered and on that date was being conveyed from her room for a physiotherapy treatment. The physiotherapy department where the treatment was to be administered was located in a building forming a part of the hospital but some distance from the building in which the plaintiff's room was located. There was employed at the hospital at that time a nurse's aide, who was instructed on this particular day to convey the plaintiff upon a stretcher to the physiotherapy department for her treatment. Leading from the door of the building in which the plaintiff's room was located was a ramp down which the 4-wheel stretcher had to pass on its way to the other building. The nurse's aide sought to procure help to get the plaintiff down the ramp but, being unable to find assistance, undertook the task alone. She lost control of the stretcher on the ramp. It rolled around several times and finally turned over, throwing the plaintiff to the ground, causing severe fright and shock. The plaintiff claims that soon thereafter she began to suffer, and ever since has continued to suffer, great pain in her upper back, shoulders and neck. It is claimed that the accident and injury occurred as a result of the negligent handling of the stretcher by the nurse's aide, and that the defendant had failed to exercise due care in employing her as a nurse's aide.

We are definitely of the opinion that the question of whether or not defendant exercised due care in the employment of the nurse's aide should have been submitted to the jury, said the Supreme Court. While it is true that there is no conflict in the evidence as to what investigation the defendant made before employing her, we are of the view that the evidence, taken as a whole, is of such a character as to cause reasonable men to reach entirely different conclusions as to whether defendant did or did not exercise due care in employing her. The counsel for the defendant, however, urged the court to reconsider the entire question of the liability of charitable institutions for torts committed by their employees.

The Supreme Court had previously declared it to be the law in this state that charitable institutions are not liable for the torts of a servant where due care had been exercised in her selection. These decisions were bottomed upon the ground of public policy. Realizing that public policy is, in its very nature, always fluctuating, varying with customs growing out of changing social, political and economic conditions and recognizing the radical changes that have taken place in each of these fields of activity during the past two decades, we believe, said the Supreme Court in the present case, it is not only proper but necessary that we reconsider the rule laid down in the prior case.

There are four reasons generally assigned for denying the liability of corporate charitable institutions for the torts of their employees:

1. The "trust fund" theory, i. e., that the funds and property of these institutions are held in trust and cannot be diverted to purposes other than that designated in the trust.

2. That the doctrine of "respondeat superior" cannot be extended so as to apply to charitable institutions because such institutions are not operated for profit.

3. The "implied waiver" theory, i. e., that when one enters a hospital for treatment he, by accepting the services rendered him, waives all right to claim damages for injuries suffered as a result of the negligence of the hospital or its employees. In other words he assumes the risk of negligence.

4. "Public policy," i. e., that to allow recovery would be against public policy.

When boiled down to its final analysis, said the Supreme Court, the rule of nonliability of these institutions as declared by all of the courts so holding, has been based upon the ground of "public policy," assigning as reasons therefor (1) that it wrongfully diverts trust funds from the purposes for which the trust was created and if permitted would stifle charity by discouraging donations for charitable purposes by those who are charitably minded (2) that it wrongfully extends the doctrine of "respondeat superior" to embrace corporations engaged in business not operated for profit or (3) that, by accepting the treatment received, the patient assumes the risk of negligence and impliedly agrees to waive liability on the part of the institution for torts committed by it or its employees. The Supreme Court then considered very thoroughly the arguments for and against each of the above theories upon which the doctrine of immunity has been based and reached the conclusion that the declaration of "public policy" is primarily a legislative function. The courts unquestionably have authority to declare a public policy which already exists, and to base its decisions upon that ground, but, before courts are justified in declaring its existence such public policy should be so thoroughly established as a state of public mind, so united and so definite and fixed, that its existence is not subject to any substantial doubt. It is equally true that, when the reason for the existence of a declared public policy no longer obtains, the courts should without hesitation declare that such public policy no longer exists. During the past two decades, the court continued, both the Federal Congress and the legislatures of practically all of the states have in various forms declared a public policy to exist in this country that is diametrically opposed to that invoked in the cases to sustain the immunity of charitable institutions from liability for damages for the torts of their servants. As examples practically every state has enacted a workmen's compensation law, occupational disease disability laws making employers liable to workmen if the injury or illness arises out of and in the course of their employment regardless of any question of negligence, employment security acts designed to take care of individuals during periods of enforced idleness, and even in cases of voluntary strikes under certain circumstances thus relieving the unfortunates of the burdens of misfortune and shifting such burdens to the shoulders of the public at large. In addition to these laws Federal legislation has encompassed the entire field of welfare and social security. We believe, the Supreme Court concluded, that these legislative declarations of public policy which relieve the individual of the burden of his misfortunes and make the general public bear the load, levying taxes directly or indirectly to carry out such policy, completely repudiate the rule of nonliability of charitable institutions for the torts of their servants based on public policy. For these reasons we are of the opinion that if public policy ever required that charitable institutions should be immune from liability for the torts of their servants, that public policy no longer exists. The Supreme Court therefore expressly overruled the holding in its prior case, and held that charitable institutions are liable for the torts of their servants from which injury proximately results to a third person, whether such person is a stranger or patient and whether the patient is a paying or nonpaying one.

Accordingly the judgment of the trial court directing a verdict in favor of the defendant was reversed and the cause was remanded for a new trial. *Ray et ux. v. Tucson Medical Center, 230 P. (2d) 220 (Arizona, 1951).*

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Am. Journal Diseases Child., Chicago

82:397-518 (Oct.) 1951

*Effect of Cortisone and Corticotropin (ACTH) on Acute Phase of Rheumatic Fever: Further Observations. A. R. Barnes, H. L. Smith, C. H. Slocumb and others.—p. 397.
Simple Procedure for Catheterizing Girls. H. F. Helmholz.—p. 426.
Perianal Dermatitis of the Newborn. A. G. Pratt.—p. 429.
Portable Humidifying Unit: II. Large-Capacity Metal Nebulizer. R. Denton and R. M. Smith.—p. 433.
Trichobezoar as Cause of Intestinal Obstruction in a Two-and-a-Half-Year-Old Child. S. Smoller, H. Schreiber and B. Scott.—p. 439.
Retrocaval Ureter: Report of Two Cases Diagnosed Preoperatively in Childhood. R. E. Parks and W. E. Chase.—p. 442.
Cystinosis (Cystine-Storage Disease): Report of Case with Chemical Isolation and Quantitative Determination of Cystine in Lymph Nodes, Spleen and Liver. F. P. King and E. P. Lochridge.—p. 446.
Situs Inversus with Levocardia. D. P. R. Keizer.—p. 456.
Selective Pancreatic Deficiency: Absent Amylase, Diminished Trypsin, and Normal Lipase. C. U. Lowe and C. D. May.—p. 459.
*Boric-Acid Poisoning: Report of Case and Review of Literature. C. Brooke and T. Boggs.—p. 465.

Cortisone and Corticotropin in Acute Rheumatic Fever.—Of 14 patients with acute rheumatic fever, 10 were treated with cortisone and 4 with corticotropin (ACTH). Cortisone was given for 22 to 55 days, with a total dose of from 1.175 gm. to 5.15 gm. Corticotropin was given for 16 to 38 days, with a total dose of from 410 to 825 mg. To be most effective cortisone or corticotropin should be given in adequate amounts early in the acute phase of the attack of rheumatic fever. Use of the drug in reduced amounts given continuously or in courses should be continued until the disease is inactive. Neither drug seemed to cure the disease or to shorten the usual duration of the acute rheumatic state. The acute manifestations of rheumatic fever were suppressed, but when administration of the drugs was discontinued exacerbations recurred until the disease had completed its usual course. Of 11 patients, 10 in their first attack of rheumatic fever and 1 in a recurrent attack of the disease, in whom evaluation of cardiac damage was attempted, 6 had no cardiac murmurs or evidence of cardiac enlargement when reexamined 1 to 10 months after their dismissal from the hospital. Two of these patients later had recurrent attacks of rheumatic fever, with reappearance of murmurs and cardiac enlargement. Five patients who received cortisone had clinical evidence of carditis before the drug was given. Cortisone exerted a definitely favorable effect on carditis in these patients. Observation of the 14 patients over a much longer period will be required to determine whether permanent cardiac injury has been sustained and to evaluate the extent of the injury when present. In one patient, organic valvular defects and cardiac hypertrophy resulting from previous attacks of rheumatic fever were not modified by administration of cortisone. Cortisone and corticotropin did not render patients immune to recurrence. Use of one or the other drug for the treatment of acute rheumatic fever should be supplemented by the most effective prophylactic measures to prevent the occurrence or recurrence of this disease. In only one patient was it necessary to discontinue the use of these drugs, and in that instance it was owing to the use of an unsatisfactory preparation of corticotropin.

Boric Acid Poisoning.—The occurrence of boric acid poisoning is reported in a girl, aged 9 months, with a diaper rash, whose father sprinkled powdered boric acid freely on the diapers and the skin lesions. Her buttocks became excoriated and extremely erythematous, respirations became rapid and shallow, a bright red confluent macular eruption of her face, head, neck, and extremities developed. She vomited coffee-ground material and passed bloody stools. Temperature rose to 104.9 F. The patient was alternately semicomatose and comatose, responding intermittently to painful stimuli. A specimen of urine obtained by catheter contained 1.6 mg. of boron per milliliter. Fluids and blood were given intravenously to combat the circulatory collapse and dehydration. Adrenal cortical extract was given because of the collapse and poor appearance of the infant. Penicillin and dihydrostreptomycin were administered because death had occurred from bronchopneumonia in some of the reported cases. The patient began having generalized twitching and sedation was used cautiously to control it. She died 26 hours after admission to the hospital. Necropsy revealed ulceration of the skin of the perineum, acute hemorrhagic enteritis, minimal ascites, cloudy swelling and central necrosis of the liver, and pulmonary congestion and edema. With the exception of the excoriation and desquamation of the epidermis and the hemorrhagic enteritis, the pathological findings could all be due to profound shock. Boron contents of urine and tissues were determined by spectrographic analysis; the amount of boron in brain, liver, kidney, heart, thymus, muscle, whole blood, and serum varied from 0.20 to 0.37 mg. per gram of tissue. Boric acid and sodium borate are sufficiently poisonous to cause severe symptoms and death when used in amounts commonly considered to be harmless. About 9 oz. (255 gm.) of powdered boric acid were used in this case. Boric acid is readily absorbed by different routes and is particularly insidious, in that symptoms may be minimal until a lethal or near lethal dose has been absorbed. The most characteristic findings are the gastrointestinal symptoms and the typical erythematous rash. In the more severely poisoned patient there is a shock-like picture and severe central nervous system involvement. The diagnosis may be further substantiated by the demonstration of boric acid in the urine. There is no known specific treatment for boric acid poisoning, and consequently treatment is symptomatic.

A.M.A. Arch. Pathology, Chicago

52:199-298 (Sept.) 1951

Study of Tumor Tissue After Transplantation: Histologic Changes Observed in Anterior-Chamber Transplants of Heterologous Tumor Tissue. A. Towbin.—p. 199.
Effect of Aureomycin on Transplanted Tumors. B. Sokoloff and W. H. Eddy.—p. 210.
Flavonoids in Experimental Cancers. B. Sokoloff, W. H. Eddy and J. B. Redd.—p. 215.
Calcified Lesions in C3H Mice Given Purified Low-Protein Diets; Tissues Involved: Heart, Skeletal Muscles, Arteries, and Lungs. B. Highman and F. S. Daft.—p. 221.
Selective Pancreatic Acinar Destruction by *dl*-Ethionine. R. C. Goldberg and I. L. Chaikoff.—p. 230.
The Human Aorta: IV. Aorta in Diabetes Mellitus. M. Faber and F. Lund.—p. 239.
Pathogenesis of Streptococcal Pneumonia in Rat. R. J. Glaser and W. B. Wood Jr.—p. 244.
Effect of Repeated Streptococcal Pulmonary Infections on Cardiovascular System in Rats. R. J. Glaser, G. J. Dammin and W. B. Wood Jr.—p. 253.
*Experimental Coronary Sclerosis: IV. Effect of Cortisone on End-Stage Coronary Sclerosis in Chickens. J. C. Paterson and C. A. Mitchell.—p. 260.
Hypertensive Cardiovascular Disease: Nature and Pathogenesis of Arteriolar Sclerosis Induced by Bilateral Nephrectomy as Revealed by Study of Its Tinctorial Characteristics. E. E. Muirhead, L. B. Turner and A. Grollman.—p. 266.

Cortisone in Experimental Sclerosis.—Of 40 relatively old chickens, 20 were given daily subcutaneous injections of cortisone acetate in doses of 4.5 mg. per kilogram of body weight for 14 days. The other 20 birds, the control group, were not given any treatment. On the 15th day after the first injection given to the treated birds, all 40 were killed by electricity. The incidence of coronary sclerosis was determined by counting the number of arteries with any degree of intimal proliferation and comparing this number with the total number of arteries examined. The

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An asterisk (*) before a title indicates that the article is abstracted.

severity of coronary sclerosis was assessed by grading and by actual measurement. There were almost twice as many foci of arterial disease in the control group (390 lesions in 1,484 cross sections of arteries, or 26%) as in the cortisone-treated group (191 lesions in 1,355 cross sections of arteries, or 14%). The size of naturally occurring fibrous plaques of the coronary arteries of the cortisone-treated birds was appreciably reduced. Thus, under the conditions of the experiment, an apparent fibrolytic effect of cortisone was achieved. There is very little similarity between end-stage coronary sclerosis of chickens and coronary atherosclerosis of man. There is, therefore, no indication from this experiment that cortisone might be efficacious in the treatment of human coronary artery disease. However, there are human diseases, such as endarteritis obliterans, rheumatic and syphilitic arteritis, periarteritis nodosa, and diffuse pulmonary vascular sclerosis, that are accompanied by cellular and fibrous proliferation of the intimal coat of arteries. Attempts to influence the course of the stenosing arterial lesions in these diseases by cortisone therapy would be justified.

American Journal of Clinical Pathology, Baltimore

21:701-798 (Aug.) 1951. **Partial Index**

Differential Diagnosis of Hyperglycemic States by Laboratory Methods. G. J. Hamwi and E. von Haam.—p. 701.

Decalcification of Bone in Relation to Staining and Phosphatase Technics. R. D. Lillie, A. Laskey, J. Greco and others.—p. 711.

Protective Action of Chlorophyll on Hepatic Necrosis in Rats. J. F. McCloskey and E. H. McGehee.—p. 723.

Blood Media for Determination of Sensitivity of Mycobacterium Tuberculosis to Streptomycin. M. S. Tarshis and A. W. Frisch.—p. 729.

Laboratory Diagnostic Tests for Cancer: Panel Discussion. W. O. Russell, R. L. Clark Jr., J. E. Dunn and others.—p. 764.

Clinical Significance of Increased Rouleau Formation in Smears of Peripheral Blood. E. D. Bayrd.—p. 777.

Blood Culture: Clinical Laboratory Study of Two Methods. V. Conner and O. T. Mallery Jr.—p. 785.

Single Medium for Detecting Urease and Indol. F. Rappaport and E. Henig.—p. 789.

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American Journal of Public Health, New York

41:1047-1208 (Sept.) 1951. **Partial Index**

Geographic Variations of Dental Caries in Oregon: V. Dental Caries Among School Children in the Willamette Valley Region. D. M. Hadjimarkos and C. A. Storvick.—p. 1052.

*Longevity and Behavior of Pathogenic Bacteria in Frozen Foods: Influence of Plating Media. S. E. Hartsell.—p. 1072.

In Vitro and in Vivo Tests with Newer Antibiotics Against Endamoeba Histolytica. O. Felsenfeld, E. R. Kadison and S. J. Ishihara.—p. 1078.

Putting Absence Records to Use. W. G. Hazard.—p. 1087.

Vocational Rehabilitation and Public Health. H. Notkin.—p. 1096.

Integrating Public Health and Commercial Rodent Control. H. L. Fellton. —p. 1101.

Public Health Benefits from Disposal of Garbage in Sewers. B. A. Poole and G. K. Erganian.—p. 1106.

The UAW-CIO and Problem of Medical Care. H. Becker.—p. 1112.

A Community Surveys Its Home Accidents. H. L. Roberts.—p. 1118.

Pathogens in Frozen Foods.—This paper stresses the need for development of methods for finding pathogens in frozen foods. The survival and behavior of certain pathogens in frozen beef and peas were studied, and the effectiveness of certain culture media in recovering viable cells was determined. The data presented showed that certain pathogens when frozen in beef or in peas will survive for many months at —9 C and —17.8 C. The metabolic requirements of the cells apparently are markedly altered, since a highly nutritive medium, YE-VI agar (yeast extract-veal infusion), will recover much larger numbers than the selective media, such as MacConkey agar, desoxycholate agar, or violet red bile agar. The number of bacteria recovered on these selective media from successive samples of frozen food decreases as storage is continued at subfreezing temperatures. Apparently the freezing process, as well as the heating process, alters the nutritional requirements of bacteria—at least, more viable cells can be detected if they are given a booster dose of needed metabolites. YE-VI agar accomplished this purpose very well. Without such a medium the pathogen may not be detected, and false confidence regarding its significance in a food may result. The longevity of the pathogens, especially in the frozen beef, is significant in this connection.

Annals of Surgery, Philadelphia

134:289-528 (Sept.) 1951

Medical Education in the Present Emergency. S. C. Harvey.—p. 289.

Physiologic Operation for Mega-Esophagus: (Dysto'a, Cardiospasm, Achalasia). O. H. Wangensteen.—p. 301.

*Effect of Various Surgical Procedures upon Acidity of Gastric Contents of Ulcer Patients. D. A. Farmer, C. W. Howe, W. J. Porell and R. H. Smithwick.—p. 319.

*Experimental Hyperfunction of Gastric Antrum with Ulcer Formation. L. R. Dragstedt, H. A. Oberhelman Jr. and C. A. Smith.—p. 332.

Operative Cholangiography: Evaluation of 406 Cases. C. G. Mixter, L. Hermanson and A. L. Segel.—p. 346.

*Subtotal Adrenalectomy in Treatment of Patients with Severe Essential Hypertension. H. A. Zintel, C. C. Wolferth, W. A. Jeffers and others. —p. 351.

Traumatic Asphyxia: Experimental and Clinical Observations with Report of Case with Concomitant Paraplegia. F. L. Reichert and J. W. Martin. —p. 361.

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Thrombosis of Dural Venous Sinuses as Cause of "Pseudotumor Cerebri." B. S. Ray and H. S. Dunbar.—p. 376.

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Total Resection of Temporal Bone for Malignancy of Middle Ear. E. Campbell, B. M. Volk and C. W. Burklund.—p. 397.

Thrombo-Embolism: Analysis of Cases at the Charity Hospital in New Orleans Over 12-Year Period. A. Ochsner, M. E. DeBakey, P. T. DeCamp and E. da Rocha.—p. 405.

Surgical Management of Post-Splenectomy Bleeder with Extra-Hepatic Portal Hypertension. A. H. Blakemore and H. F. Fitzpatrick.—p. 420.

Selection of Patients for Portacaval Shunts: With Summary of Results in 61 Cases. R. R. Linton.—p. 433.

Congenital Arteriovenous Aneurysm of Right External Carotid Artery and Posterior Facial Vein with Absence of Branches of External Carotid Artery: New Method of Obliterating Inaccessible Venous Sac and Fistula. M. Gage.—p. 444.

Diagnosis and Management of Tumors of Adrenal Gland. K. S. Grimson, J. R. Emlet and E. C. Hamblen.—p. 451.

Subtotal Adrenalectomy for Cushing's Syndrome: Preliminary Report of 29 Cases. J. T. Priestly, R. G. Sprague, W. Walters and R. M. Salassa. —p. 464.

Fallacy of Current Surgical Fad—Three-Minute Preoperative Scrub with Hexachlorophene Soap. P. B. Price.—p. 476.

Permanent Pedicle Blood-Carrying Flaps for Repairing Defects in Avascular Areas. J. B. Brown, M. P. Fryer and F. McDowell.—p. 486.

Effect of ACTH and Cortisone on Survival of Homologous Skin Grafts. E. H. Ellison, B. C. Martin, R. D. Williams and others.—p. 495.

Adrenal Cortical Hormones and Homografting: Exploration of Concept. P. A. Weisman, W. C. Quinby Jr., A. Wight and B. Cannon.—p. 506.

Can Resistance to Cancer be Induced? H. B. Stone, R. M. Curtis and J. H. Brewer.—p. 519.

Effect of Surgical Procedures on Gastric Acidity of Ulcer Patients.—To determine the effect of surgery on the gastric acidity of ulcer patients, tests were made on 10 normal persons, 41 patients with duodenal ulcer, and 12 patients with gastrojejunal ulceration following a variety of operations. The quantity of acid in the gastric contents of duodenal ulcer patients was found to be greater than in normal persons following stimulation by insulin, beef broth, and histamine. The hydrogen ion concentration in the gastric contents was also greater in duodenal ulcer patients than in normal persons, particularly under fasting conditions. Patients who had gastrojejunal ulcers following various operations for duodenal ulcer had an acidity similar to that of persons with untreated duodenal ulcers. Resection of 50% of the stomach combined with vagotomy resulted in reduction in both the quantity of free acid and the hydrogen ion concentration in the gastric contents. The effect of this combined procedure and of subtotal resection alone on both quantity of free acid and hydrogen ion concentration was more marked than that following vagotomy plus posterior gastroenterostomy. When gastric resection was combined with vagotomy, removal of more than one-half of the stomach appeared to be no more effective than removal of approximately half the stomach, but removal of an estimated one-third of the stomach was considerably less effective. The results of removal of 50% of the stomach combined with vagotomy seem superior to those of more radical resections with or without vagotomy. If vagotomy combined with posterior gastroenterostomy gives adequate protection against the ulcer diathesis it is probably not because of the effect on gastric acidity alone. The acidity following this procedure is frequently within the range found in patients in whom gastrojejunal ulcers have developed. The greatest drawback to pro-

cedures involving resection of the vagus nerves is the hazard that the denervation may not be complete. Also, the possibility of regeneration of the vagus nerves has not yet been excluded.

Gastric Antrum and Ulcer Formation.—Experiments on dogs revealed that transplantation of the antrum of the stomach into the side of the transverse colon greatly increased gastric secretion. This is due to the excessive or long-continued production of a humoral agent, gastrin, since it occurs if all of the nervous connections between the antrum and the stomach have been divided. When the antrum of the stomach was transplanted into the colon and the intestinal continuity was reconstructed by gastrojejunostomy, large stoma ulcers developed in 80% of the animals. Transplantation of the antrum of the stomach into the colon with reestablishment of intestinal continuity by gastroduodenostomy resulted in the formation of stoma ulcers in 20% of the animals. When the entire stomach was isolated from the intestinal tract and its vagus innervation interrupted, a meager secretion of gastric juice was produced, and animals were kept for many months, or indefinitely, without the production of ulcers in the isolated stomach. When the antrum was removed from the isolated stomach, however, and transplanted into the colon as a diverticulum, gastric secretion was greatly increased, and ulcers regularly developed in the isolated stomach, progressed, caused hemorrhage, or perforated, in a relatively short time. Although a hypersecretion of gastric juice of antrum origin results in ulcer formation in animals, evidence is not yet available to indicate that the hypersecretion of gastric juice characteristically found in duodenal ulcer patients is due to hyperfunction of the antrum, although this possibility should be kept in mind. The development of gastric and stoma ulcers in dogs when the antrum of the stomach is transplanted into the colon provides a new method for the production of ulcers that resemble clinical lesions and the opportunity to evaluate various prophylactic and therapeutic measures. The relatively few stoma ulcers that appeared following gastroduodenostomy as compared with the high incidence and large size of the stoma ulcers that appeared following gastrojejunostomy would seem to indicate a much greater resistance of the duodenal as compared with the jejunal mucosa and suggest that gastroduodenostomy may be preferable to gastrojejunostomy as a drainage operation.

Subtotal Adrenalectomy in Hypertension.—Hypofunction of the adrenals (Addison's disease) is associated with hypotension, whereas certain types of hyperfunction of the adrenal gland, e. g., Cushing's syndrome and pheochromocytoma, are associated with hypertension. These facts and the unsatisfactory results of sympathectomy in hypertension induced Zintel and associates to try subtotal adrenalectomy. Their procedure is original only in regard to the amount of adrenal tissue removed. In 1949 they began to remove one adrenal gland completely at the time of the second stage thoracolumbar sympathectomy in patients with severe essential hypertension, but unilateral adrenalectomy produced no changes when the remaining adrenal was functioning. In 1 of the 16 patients who had unilateral sympathectomy and adrenalectomy, 90% of the remaining adrenal was subsequently removed, after which the blood pressure became normal. They removed from 88 to 98% of the adrenal in 26 patients with severe essential hypertension. In 11 of these, removal of the adrenal tissue was in addition to a thoracolumbar, supradiaphragmatic, or subdiaphragmatic sympathectomy. In 13, up to 98% of the adrenals was removed but no sympathectomy was done, and in 2 patients complete adrenalectomy was performed. Results were evaluated in 11 patients, who were observed for more than four months; three of these patients died. In the eight living patients the average blood pressure before adrenalectomy was 228/142; from 4 to 12 months after adrenalectomy it was 167/108. All of the eight improved in one or more of the following symptoms: headache, nausea, vomiting, dyspnea, decreased vision, and weakness. All were able to return to part-time or full-time activity, whereas they were incapacitated before adrenalectomy. In six of the eight patients slight to moderate increase in pigmentation of the skin has developed; two require adrenal replacement therapy at present. The possibility that subtotal adrenalectomy may find its greatest usefulness as an adjunct to limited or extensive sympathectomy and splanchnicectomy is being studied.

Annals of Western Medicine & Surgery, Los Angeles

5:755-810 (Sept.) 1951

*Chronic Amebiasis: Common Disease. R. G. Lehman and L. R. Thompson.—p. 755.
Desmoid Tumors of Abdominal Wall. J. Gaster and B. Gregorius.—p. 759.
Procaine Hydrochloride Blood Mixture for Treatment of Hemorrhage During Surgical Anesthesia. F. G. Jensen.—p. 765.
Hemostatic Effects of Powdered Gelfoam* Thrombin Solution and Blood Transfusions in Instance of Recurring Massive Hemorrhage from Large Chronic Gastric Ulcer: Report of Case. D. C. Collins, W. F. Clark and S. P. Dimitroff.—p. 767.
*Poliomyelitis Following Tonsillectomy: Report of Six Cases. L. S. Goerke and A. G. Bower.—p. 770.
Diagnosis and Differential Diagnosis of Rheumatic Fever. G. C. Griffith and J. A. Sheinkopf.—p. 773.
Delayed Cardiac Arrhythmias Following Pneumonectomy. E. Phillips.—p. 778.
Postoperative Management of Patients Who Have Undergone Bilateral Ureterosigmoidostomies. J. Kaplan.—p. 782.
Carcinoma of Vulva. E. A. Pearson.—p. 785.

Chronic Amebiasis.—The occurrence of chronic amebiasis is reported in 238 private patients in San Pedro, Calif., from March, 1947, to December, 1950. Parasitism due to Endameba histolytica is one of the commonest chronic diseases in the United States. Of the 238 patients, 60 had symptoms pointing to a pathological process in the right iliac region, although their complaints were actually caused by E. histolytica. Differentiation of chronic amebiasis from acute appendicitis thus is important and difficult; generalized abdominal cramps, anorexia, vomiting, fever, and leukocytosis are more suggestive of acute appendicitis than of amebiasis, while pain in the lower right part of the abdomen, accompanied by mild to moderate tenderness and unassociated with other symptoms, may be frequently due to chronic amebiasis. Abdominal pain caused by amebiasis may simulate numerous other conditions besides appendicitis, such as cholelithiasis, irritable colon, or peptic ulcer. Neuromuscular symptoms, such as myalgia and leg pain, drowsiness, poor memory, exhaustion, and easy fatigability, often suggest the diagnosis of psychoneurosis. Circulatory symptoms were not outstanding in the authors' patients. Only constant vigilance of the physician coupled with an awareness of the various clinical conditions simulated by amebiasis will suggest the presence of the disease. The diagnosis of amebiasis is a laboratory procedure. Examination of the feces is part of any thorough physical examination and is possibly as important as routine blood or urine examinations.

Poliomyelitis Following Tonsillectomy.—In Los Angeles, in the summer of 1950, poliomyelitis followed tonsillectomy within 15 days in six children between the ages of 4 and 9 years. Of the six patients, five had bulbar involvement and two died. Of 6,040 cases of poliomyelitis occurring in California during 1948 and 1949, 30 followed tonsillectomy or adenoidectomy within two months, and 16 (53.3%) of the 30 patients had bulbar involvement. Evidence thus points to a risk of bulbar involvement significantly higher following tonsillectomy and adenoidectomy than in cases not following these surgical interventions, thus supporting the policy of deferment of elective tonsillectomy and adenoidectomy during increased incidence of poliomyelitis.

Bull. School Med. Univ. Maryland, Baltimore

36:103-142 (July) 1951

Diagnosis and Treatment of Acute Abdomen. L. K. Ferguson.—p. 103.
Penicillin in Bronchial Asthma. H. M. Bubert.—p. 115.
New Type Pull-Out Wire for Tendon Surgery: Preliminary Report. A. R. Mansberger Jr., E. R. Jennings, E. P. Smith Jr. and G. H. Yeager.—p. 119.
Torulosis of Central Nervous System: Biochemical Behavior of Causative Organism. W. H. Mosberg Jr. and J. D. McAlpine.—p. 122.
*Gout—Recent Advances. E. S. McCabe.—p. 126.

Gout: Recent Advances.—According to McCabe, gout seems to be the result of an inborn defect of metabolism, which at some time or other manifests itself as hyperuricemia and/or gouty arthritis. Hyperuricemia is found in the blood of a large percentage of relatives of gout patients. Some investigators concluded that hyperuricemia results from a single autosomal dominant gene and that only a small percentage of the heterozygous persons manifest gouty arthritis, whereas homozygous

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persons are prone to have tophaceous gout as well. The changes that occur in the uric acid metabolism and the resultant symptoms can apparently be accounted for by the outpouring of steroid hormones during the alarm reaction precipitated by emotion, infection, surgical procedures, physical exertion, allergy, alcohol, dietary indiscretion, and drugs, e. g., liver extract. An allergic factor may be the synergist that magnifies small changes in the desoxycorticosterone-11 oxysteroid ratio. The first attack (stage 1) of acute gouty arthritis usually occurs suddenly, lasts about 3 to 10 days, and then disappears completely. It affects the great toe or the instep, ankle, knee, or other region. The disease usually increases in tempo and severity, attacks coming on semiannually or oftener. Later attacks (stage 2) are prone to be polyarticular and febrile. With the polyarticular stage, subcutaneous tophi and involvement of bursae are common. Osseous tophi may be found in chronic gouty arthritis. The mental aspects of the disease are frequently seen in phase 3, when the patient's memory is impaired; the speech becomes thick or slurred, and the patient may become irritable. The early monarticular attack may be aborted by a saline cathartic and colchicine. This may be followed by sodium salicylate or cinchophen for a few days to combat hyperuricemia. At times morphine may be necessary to relieve the pain. The diet should be low in purines and fats and high in carbohydrates. Alcohol should be avoided. In chronic gouty arthritis fever therapy may be required. If tophaceous ulcers occur, débridement usually results in prompt healing. In gouty nephritis, a low protein diet and a more generous fluid intake are demanded. Corticotropin has been shown to influence uric acid excretion. It hastens the control of the acute attack, but it can also precipitate an attack if given in a period of remission. Final evaluation of this hormone requires a more intensive trial. Cortisone does not appear to be of as much value.

Electroencephalography and Clin. Neurophys., Boston

3:261-392 (Aug.) 1951. **Partial Index**

Changes in EEG Under Barbiturate Anaesthesia Produced by Electro-Convulsive Treatment and Their Significance for Theory of ECT Action. M. Roth.—p. 261.

Electrocorticography in Psychomotor Epilepsy. J. R. Green, R. E. H. Duisberg and W. B. McGrath.—p. 293.

Electroencephalogram in ACTH and Cortisone Treated Patients. I. Pine, F. L. Engel and T. B. Schwartz.—p. 301.

Effect of Cortisone on Electroencephalogram. W. J. Friedlander and E. Rottger.—p. 311.

Slow Voltage Variation of Cortical Spreading Depression of Activity. A. A. P. Leão.—p. 315.

Electroencephalographic Changes Associated with Experimental Temporary Focal Cerebral Anemia. J. Harvey and T. Rasmussen.—p. 341.

A Case in Which Visual Hallucinations Related to Past Experience Were Evoked by Photic Stimulation. A. C. Mundy-Castle.—p. 353.

Electrophrenic Controlled Hyperventilation for EEG Activation. J. Romero and C. Marshall.—p. 357.

Endocrinology, Springfield, Ill.

49:1-148 (July) 1951. **Partial Index**

Lipid Distribution in Sertoli Cell and Leydig Cell of Rat Testis as Related to Experimental Alterations of Pituitary-Gonad System. K. M. Lynch Jr. and W. W. Scott.—p. 8.

Comparison of Exophthalmos and Tissue Changes Induced by Active and Inactivated Thyrotropic Hormone. B. M. Dobyns and R. W. Rawson.—p. 15.

Effect of Excess Iodide upon Anterior Pituitary Cytology of Completely Thyroidectomized Rat and Its Bearings on Question of Extrathyroidal Thyroxine Synthesis. R. F. Hum, R. C. Goldberg and I. L. Chaikoff.—p. 21.

Cytochemical Changes in Adrenal Cortex of Rat in Pyridoxine Deficiency. R. B. Stebbins.—p. 25.

Neuro-Endocrine and Endocrine Influences on Circulating Blood Elements. E. Simms, M. Pfeiffenberger and P. Heinbecker.—p. 45.

Influence of Pancreatectomy on Metabolic State of Alloxan-Diabetic Dog. I. A. Mirsky, P. Futterman, J. Wachman and G. Perisutti.—p. 73.

Gastric Secretion in Adrenalectomized Rat. R. J. Madden and H. H. Ramsburg.—p. 82.

Effect of Hypophysial Stalk Section on Adenohypophysial Function. Pei Chin Tang and H. D. Patton.—p. 86.

Effect of Purified Growth Hormone on Urea Formation in Nephrectomized Rats. J. A. Russell.—p. 99.

Histochemical Demonstration of Ketosteroids in Virilizing Tumors of Adrenal Cortex. A. M. Seligman and R. Ashbel.—p. 110.

Observations on Interrelationship Between Insulin, Adrenal Cortex and Non-Specific Stress (Cold) in Adipose Tissue Glycogen Synthesis in Rat. F. L. Engel.—p. 127.

Observations on Relation of Renal Function Changes to Electrolyte and Glycosuric Effects of ACTH in Man. J. D. Alexander, E. D. Pellegrino, S. J. Farber and D. P. Earle.—p. 136.

Industrial Medicine and Surgery, Chicago

20:385-430 (Sept.) 1951. **Partial Index**

New Developments in Industrial Surgery. H. E. Mock Jr.—p. 385.

Appraisal of Urinary Porphyrin Test in Detection of Lead Absorption. A. L. Brooks.—p. 390.

Occupational Cancer and Other Health Hazards in Chromate Plant: Medical Appraisal: II. Clinical and Toxicologic Aspects. T. F. Mancuso.—p. 393.

Pharmacologic Action and Acute Toxicity of Glucuronic Acid Lactone. W. B. Deichmann and B. Hopfenspirger.—p. 417.

*Fractures of Metatarsals and Tarsals. R. J. Bennett.—p. 423.

Fractures of Metatarsals and Tarsals.—The 631 patients reviewed in this paper had 842 metatarsal and 62 tarsal fractures, a total of 904 fractures. The first metatarsal was the most frequently fractured metatarsal, and the navicular was the most frequently fractured tarsal bone. It is interesting that about half of the metatarsal fractures (422 of 842) and exactly half of the tarsal fractures (31 of 62) involved single bones. Prompt reduction is the most important step in treatment of fractures of the tarsals and metatarsals. Where the fracture is displaced or compound, an anesthetic is indicated. Adequate fixation is imperative. In only a few instances was open reduction necessary and in only a few cases was the interposition of tissues found. The oblique fractures of a metatarsal were most difficult to control during healing. These were most satisfactorily held by means of a stainless steel pin and a rubber band extension placed through the distal phalanx of the toe. In most simple fractures, union was affected in from four to eight weeks, except in cases in which there were complications such as burns and crushed tissues, and in a few cases in which the patient did not fully follow instructions. In a few cases there was decalcification of the fractured bones. Arteriosclerosis, as evidenced by a pipestem posterior tibial artery, seemed to slow the healing process but did not stop it. Depending upon the amount of callus present, weight-bearing was allowed in an average of 8 to 12 weeks. In cases in which there was a delay or failure to restore normal alignment temporary or permanent disability resulted. Both the frequency and severity of fractures of the bones of the feet are less than they were 10 years ago, owing to intensive safety programs and protective devices for the feet.

International Journal of Leprosy, New Orleans

19:117-264 (April-June) 1951. **Partial Index**

Field Study of Leprosy in Cordova, Philippines: Resurvey in 1941 After Eight Years. R. S. Guinto, J. A. Doull, H. Bancroft and J. N. Rodriguez.—p. 117.

*Effects of Adrenocorticotropic Hormone (ACTH) in Lepromatous Lepra Reaction. M. Roche, J. Convit, J. A. Medina and E. Blomenfeld.—p. 137.

Action of the Monosubstituted Succinyldiamino-diphenyl Sulfone in Leprosy. H. Floch and P. Destombes.—p. 147.

Blood and Urine Concentrations of Free and Hydrolyzed Sulfones in Leprosy Patients Under Treatment. Sister Hilary Ross and F. Gemar.—p. 153.

Lepromin Test in Contacts, with Particular Reference to Positive Bacteriological Findings. N. Figueredo and S. D. Desai.—p. 165.

Cultivation and Morphological Study of Pleomorphic Organism from Blood of Leprosy Patients. E. Alexander-Jackson.—p. 173.

Modification of Technique of Ziehl-Neelsen for Bacilloscopy in Leprosy Patients Treated with Sulfones. F. F. Wilkinson.—p. 195.

Corticotropin in Lepra Reaction.—Lepra reaction is a troublesome incident in the chronic, drawn-out course of lepromatous leprosy. There has been no way of controlling satisfactorily the characteristic fever, malaise, joint and muscle aches, and cutaneous lesions that periodically beset many of these patients. Since corticotropin has produced symptomatic benefit in conditions regarded as "allergic," its trial in the lepra reaction appeared logical. Six patients with lepromatous leprosy undergoing lepra reaction were given corticotropin in doses of 40 to 80 mg. a day for a maximum of seven days. A rapid regression of the reaction symptoms occurred in all cases, and in most of them the temperature fell to normal within 24 hours. Iridocyclitis in one patient and peripheral neuritis in two others were rapidly improved, but most of the symptoms returned a few days after cessation of treatment. It is felt that through the rapid control of the reaction symptoms, corticotropin may contribute to the treatment of leprosy, particularly in the cases in which the reaction is an obstacle to the continued administration of a chemotherapeutic agent.

Journal of Investigative Dermatology, Baltimore

17:125-176 (Sept.) 1951

Use of Silicote® as Skin Protectant. J. R. Talbot, J. K. MacGregor and F. W. Crowe.—p. 125.
Use of Gastric Mucin in Experimental Infections with Dermal Viruses. M. J. Lipnik and G. D. Baldridge.—p. 127.
Rapid and Simple Method for Obtaining Punch Biopsies Without Anesthesia. F. Urbach and W. B. Shelley.—p. 131.
Hereditary Leuconychia Totalis. W. T. Kruse, E. P. Cawley and C. W. Cotterman.—p. 135.
Occurrence of Contact Dermatitis from Oil Soluble Gasoline Dyes. J. H. Lamb and E. S. Lain.—p. 141.
Distribution of Glycogen and Lipids in Human Skin. W. Montagna, H. B. Chase and J. B. Hamilton.—p. 147.
Aluminum Penicillin Administered Orally: Comparison with Sodium Penicillin. W. P. Boger and J. O. Beatty.—p. 159.
Influence of Antihistamines on Skin Tests with Bacterial and Fungous Antigens. S. Epstein.—p. 165.
Observations on Treatment Mechanisms in Psoriasis with Special Reference to Terramycin. J. H. Stokes and W. T. Ford.—p. 171.

Journal Lab. and Clinical Medicine, St. Louis

38:331-496 (Sept.) 1951

Role of Infection in Radiation Injury. C. P. Miller, C. W. Hammond and M. Tompkins.—p. 331.
*ACTH in Experimental Poliomyelitis in Monkeys and Mice. J. D. Ainslie, T. Francis Jr. and G. C. Brown.—p. 344.
Influence of ACTH on Resistance of Monkeys to Yale SK Strain of Poliomyelitis Virus. C. Foster, M. M. Sigel, W. Henle and J. Stokes Jr. —p. 359.
Effect of Cortisone in Streptococcal Lymphadenitis and Pneumonia. R. J. Glaser, J. W. Berry, L. H. Loeb and W. B. Wood Jr.—p. 363.
Chronic Melioidosis: Bacteriologic and Clinical Correlation in Diagnosis. M. W. Garry and M. L. Koch.—p. 374.
Comparative in Vitro Study of Guinea Pig Brain Oxidations as Influenced by Xenon and Nitrous Oxide. C. B. Pittinger, R. M. Featherstone, S. C. Cullen and E. G. Gross.—p. 384.
Influence of Oxygen and Carbon Dioxide Levels During Anesthesia upon Postsurgical Hepatic Damage. J. L. Sims, L. E. Morris, O. S. Orth and R. M. Waters.—p. 388.
D-Tubocurarine Chloride Concentrations in Human Plasma After Intravenous Injection During Anesthesia. C. B. Pittinger, L. E. Morris and S. C. Cullen.—p. 397.
Influence of Heat upon RH, Lewis, and H. Agglutinogens. E. V. Hulse. —p. 402.
Electrophoretic Studies on Serum and Urine Proteins in Nephrosis Treated with ACTH. E. B. Farnsworth and N. C. Ruppenthal.—p. 407.
Serum Lipid Analysis in Nephrotic Syndrome Under ACTH Administration. J. W. Soshea and E. B. Farnsworth.—p. 414.
Observations on Absorption, Distribution, and Excretion of Elkosin (N'-[2,6-Dimethyl-4-Pyrimidyl]-sulfanilamide) in Man. J. A. Prior and S. Saslaw.—p. 420.
Human Serum Tributyrinase: II. Levels in Tuberculosis. J. Tuba and R. Hoare.—p. 428.
Detection of Occult Blood in Feces Including Observations on Ingestion of Iron and Whole Blood. A. Peranio and M. Bruger.—p. 433.
Normal and Abnormal Variations and Clinical Significance of One-Minute and Total Serum Bilirubin Determinations. L. Zieve, E. Hill, M. Hanson and others.—p. 446.

Corticotropin in Experimental Poliomyelitis.—This report deals with experiments to determine the effect of corticotropin on the course of experimental poliomyelitis in mice and monkeys. In each of two experiments corticotropin was given in doses of 25 mg. every six hours to 12 rhesus monkeys for three days before intracerebral inoculation of the Minnesota strain of poliomyelitis virus. Administration of the drug was continued in six of the animals until the onset of paralysis. Six controls in each experiment received virus but no hormone. A physiological response was obtained with the hormone, as shown by the precipitous drop and subsequent low level in the number of circulating eosinophils and by the increased excretion of 17-ketosteroids in the urine. There were no changes in the fasting blood sugar values or glucose tolerance curves. In all 24 monkeys treated with corticotropin and in 10 of 12 controls poliomyelitis developed. In 4 of 12 monkeys receiving continuous treatment, paralysis occurred on the fifth day, two to three days earlier than the first paralysis in the 12 controls. Paralysis occurred 0.6 to 2.6 days earlier in the groups continuously treated than in the controls, and no earlier or 1.0 day earlier in the groups treated only before inoculation with the virus. This suggests that corticotropin not only fails to induce increased resistance to the virus but appears to render the host slightly more susceptible.

J. National Malaria Society, Columbia, S. C.

10:197-286 (Sept.) 1951. **Partial Index**

Effectiveness of Repellents Against Several Species of Anopheles Mosquitoes. B. V. Travis.—p. 197.
Comparative Susceptibility of Four Anopheline Mosquitoes to Plasmodium Relictum. A. V. Hunninen.—p. 216.
Identification of Early Larval Instars of Three Common Anophelines of Southern Georgia, U. S. A. S. G. Breeland.—p. 224.
Distribution and Control of Mosquitoes in Rice Fields in Stanislaus County, California. B. G. Markos.—p. 233.
Comparative Evaluation of Certain High Pressure Insecticidal Aerosols Against Musca Domestica. S. L. Resnick and R. L. Crowell.—p. 248.
Some Epidemiological Aspects of Malaria Control with Reference to DDT. P. F. Russell.—p. 257.

Journal of Nutrition, Philadelphia

44:487-632 (Aug.) 1951. **Partial Index**

Studies on Iodine Requirements of White Rats During Growth, Pregnancy and Lactation. H. E. Parker, F. N. Andrews, S. M. Hauge and F. W. Quackenbush.—p. 501.
Propylthiouracil, Thyroid, and Dietary Liver Injury. E. A. Sellers and R. W. You.—p. 513.
Effect of Time Factor and Calorie Level on Nitrogen Utilization of Young Women. R. M. Leverton, M. R. Gram and M. Chaloupka. —p. 537.
Study of Endogenous Nitrogen Output of College Women, with Particular Reference to Use of Creatinine Output in Calculation of Biological Values of Protein of Egg and of Sunflower Seed Flour. M. L. Bricker and J. M. Smith.—p. 553.
Transamination Reaction in Normal and B6-Deficient Hamsters. G. Shwartzman and H. Hift.—p. 575.
Biosyntheses of Tryptophan and Niacin and Their Relationships. D. M. Bonner and C. Yanofsky.—p. 603.

Journal of Urology, Baltimore

66:315-476 (Sept.) 1951

*Influence of Alumina Gels on Prevention of Urinary Calculi. G. S. Barrett.—p. 315.
Traumatic Renal Infarction Concurrent with Massive Fat Embolism. G. M. Carver Jr.—p. 331.
Elliptical End-to-Side Connection Technique Applied to Repair of Ureteropelvic Juncture Constriction: Report of Three Cases. W. W. Miller Jr.—p. 340.
Spinal Cord Injury: Some Urological Aspects. G. C. Prather.—p. 347.
Pathological Changes in Urethra of Paraplegic Patients. A. E. Comarr and E. Bors.—p. 355.
Transurethral Prostatic Resection: Discussion of Some Principles and Problems. R. M. Nesbit.—p. 362.
Carcinoma of Prostate. J. C. Kimbrough and R. B. Rowe.—p. 373.
Histological Studies of Carcinoma of Prostate Treated by Estrogen. P. R. Rezek, M. M. Coplan, F. M. Woods and P. D. Melvin.—p. 379.
Treatment of Carcinoma of Prostate. R. H. Flocks, W. N. Harness, J. M. Tudor and L. Prendergast.—p. 393.
Needle Biopsy of Prostate: New Needle Biopsy Instrument. W. F. Melick. —p. 408.
Osteitis Pubis. H. Mortensen.—p. 412.
*Osteitis Pubis: Its Etiology and Pathology. L. L. Lavalle and F. C. Hamm.—p. 418.
Antihistamine—Possible Relationship to Other Factors Influencing Infection. W. P. Herbst.—p. 433.
Male Factor in Fertility and Infertility: II. Spermatozoon Counts in 1,000 Men of Known Fertility and in 1,000 Cases of Infertile Marriage. J. MacLeod and R. Z. Gold.—p. 436.
Role of Urologist in Problem of Infertility. I. Gersh.—p. 450.
Translumbar Serial Aortography: New Medium and New Technique. W. F. Melick, C. P. Yarbrough and T. D. Boler.—p. 458.
*Arteriography as Observed in 80 Patients at St. Louis City Hospital. G. W. Reagan Jr. and G. Carroll.—p. 467.

Alumina Gels to Prevent Urinary Calculi.—Renal stones are prone to recur after excision and to increase in size despite all known preventive measures. The treatment most commonly employed attempted to reduce urinary phosphate precipitation by continuous acidification of the urine. However, this treatment is often limited in effectiveness by the presence of ammonia-forming organisms in the urinary tract and impairment of renal function. Under such circumstances, a highly acidifying regimen is hazardous, because of the danger of acidosis. In many patients with urinary infection no amount of acidification will reduce the urinary pH to the desired acid range. The present study was undertaken to evaluate certain alumina gels in preventing formation and enlargement of renal stone and to determine the metabolic role of magnesium in the development of urinary calculi. It was found that alumina gel causes reduction in urinary inorganic phosphorus and increases excretion of phosphate in the stool of normal subjects and those with stones. Aluminum hydroxide gel (amphojel®) with magnesium trisilicate was ad-

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ministered, in doses of 30 to 45 cc. four times daily, for two and a half years to 34 patients to prevent urinary calculi. In 30 the treatment was successful. Of three patients who did not adhere to the regimen, one showed stone growth and the other passed a stone through a nephrostomy tube. In a third, stones formed proximal to a ureteral stricture. In a fourth patient, with idiopathic hypercalcinuria, recurrence was attributed to a high urinary calcium level. There was no evidence of decalcification of the skeleton or other ill effects in any of the patients studied. Observations on two uremic patients suggest that the phosphate is diverted through the gut, thus partially relieving the kidney. This may be of value in uremia by facilitating excretion of urea, with reduction of serum urea nitrogen. Ten patients who had received aluminum hydroxide gel with magnesium trisilicate previously were treated with an aluminum carbonate gel (basaljel®). It reduced urinary phosphorus excretion to lower levels than did plain aluminum hydroxide gel alone or combined with magnesium trisilicate and was found more palatable. The aluminum carbonate gel, therefore, appears to be the drug of choice for prophylaxis of calculi in the urinary tract. Since experiments suggest that a high urinary magnesium level may increase solubility of the calcium oxalate and maintain all calcium in solution, it appears advisable for stone-forming patients to take a diet adequate in magnesium to reduce endogenous oxalic acid excretion to a minimum.

Osteitis Pubis.—Osteitis pubis has been designated also as periostitis pubis, osteochondritis pubis, panosteitis pubis, osteoporosis of the pelvic bones, and acute bone atrophy of Sudeck. Lavalle and Hamm show that osteitis pubis is a true inflammatory disease of the anterior pelvic girdle and not a sterile necrosis of bone as in Sudeck's atrophy. This paper concerns pathological and bacteriological studies in three cases, all of which followed retropubic prostatectomy, and with the autopsy of a case in which healing occurred and the patient died 18 months later of another disease. In the three cases in which tissue was obtained, a clinical diagnosis of osteitis pubis was made and confirmed by roentgenological findings. In two cases a pure culture of Pseudomonas aeruginosa was obtained and in the third patient a mixed infection of Ps. aeruginosa and Proteus vulgaris existed. These gram-negative organisms are bacteria of low virulence and low pathogenicity. This explains the long incubation period between the prostatectomy and the onset of symptoms of osteitis pubis. More biopsies in other cases will be needed to show whether the organisms can produce this disease. Pathologically the lesion consists of subacute inflammatory infiltration and chronic inflammation involving the periosteum, bone, and cartilage. Plasma cells, eosinophils, and granulation tissue are seen in the inflammatory tissue. All of the known sulfonamides and antibiotic agents were tried, and none were found to be specific. Prophylaxis is the best treatment. The skin may be prepared with either green soap or the newer antiseptic detergents, but the authors are convinced that the ordinary preoperative painting of the suprapubic region is not sufficient to prevent osteitis pubis.

Arteriography.—The practical value of arteriography and its hazards are evaluated on 80 patients in whom arteriography was done at the St. Louis Hospital. Hazards mentioned by other investigators include hemorrhage, extra-aortic injection of contrast medium, acute iodinism, allergic reaction, mesenteric thrombosis, perforation of an intraperitoneal viscus, pneumothorax, aortic intramural injection, and injection of full quantity of contrast medium into a branch of the aorta. The authors concluded that translumbar arteriography is relatively safe if the procedure is performed with attention to detail by one with detailed knowledge of the regional anatomy and adequate skill. Proper preoperative evaluation of the patient's renal, cardiac, and liver reserve should be made. Sensitivity to contrast medium should be checked. The cases most likely to benefit from arteriography are those in which the diagnosis, prognosis, and management cannot be definitely stated by the previous urological examination. The method was found helpful in the differential diagnosis of renal masses: in hypernephroma, polycystic disease, solitary cyst, hydronephrosis, retroperitoneal tumors not arising from the kidney, and horseshoe or ectopic kidney. Arteriography was helpful also in selecting the proper operative procedure. Nephrectomy rather than plastic repair was indicated in the presence of scanty blood supply to a hydronephrotic kidney; renal vein involvement in hypernephroma suggested an inoperable condition; distribution of renal supply suggested heminephrectomy in certain cases of renal calculus with calycectasis. Arteriography was helpful also in aneurysms of the aorta, the renal artery, and in other branches of the aorta.

Kansas Medical Society Journal, Topeka

52:1-A-76-A (Supplement to Sept.) 1951

Surgical Treatment of Cervical Cancer. D. G. Morton.—p. 5-A.
Therapy with Radioactive Isotopes. J. H. Lawrence.—p. 7-A.
Cancer and Allied Diseases in Children. H. W. Dargeon.—p. 10-A.
Surgical Treatment of Advanced Cancer. E. D. Sugarbaker.—p. 14-A.
Congenital Defects and Associated Neoplastic Disorders in Children. H. W. Dargeon.—p. 21-A.
Carcinoma of Breast. E. D. Sugarbaker.—p. 23-A.
Tracer Research and Cancer. J. H. Lawrence.—p. 31-A.
Diagnosis of Accessible Cancer. D. P. Slaughter.—p. 35-A.
*Tumors of Spine and Spinal Cord—With Discussion of Diagnostic Significance of Back Pain. E. H. Campbell Jr. and R. D. Whitfield. —p. 40-A.
General Pathology of Endocrine Tumors. H. T. Karsner.—p. 45-A.
Treatment of Cancers of Anus and Rectum. G. T. Pack.—p. 48-A.
Relation of Pregnancy to Malignancy. D. G. Morton.—p. 57-A.
Treatment of Cancer of Face, Mouth and Neck with Irradiation. C. L. Martin.—p. 59-A.
Recent Advances in Cancer Therapy. D. P. Slaughter.—p. 64-A.
Alleviation of Cancer Pain. E. H. Campbell Jr. and R. D. Whitfield. —p. 71-A.

Tumors of Spine and Spinal Cord: Diagnostic Significance of Back Pain.—The diagnosis of neoplasms of spine and spinal cord is often delayed because backache, their most frequent presenting symptom, is found in such a variety of disorders that its origin is often difficult to trace. Posture, sprains, and occupation, together with some form of arthritis, doubtless account for the majority of such pains, but it is of great importance to recall that back pain is the cardinal symptom in most intrinsic disorders of the spine. The authors of this paper discuss neural pathways involved in back pain, the nerve supply of the vertebrae and their ligaments, the relation of spinal nerves to vertebral structures, and the distribution of pain in spinal nerve compression. Of the primary intramedullary tumors of the spinal cord, ependymomas and astrocytomas may be relatively benign, and if discovered in time, can be successfully removed. They produce little pain. Many of the extramedullary tumors (meningiomas and neurofibromas) are benign and slow-growing. Backache, root, and girdle pains may result from root compression. Bone metastases, particularly in the spine, are the first clinical signs of some malignant diseases (lung cancer) that remain silent for a long time. Either the vertebral body or the neural arch may be involved; the intervertebral disk is singularly resistant to malignant disease, a good point to remember in differential diagnosis. Hodgkin's disease, multiple myeloma, and Paget's disease may be associated with backache. Bone infections of various types, such as tuberculosis and osteomyelitis, may be confused with malignant diseases. Marie-Strümpell arthritis (rheumatoid arthritis of the spine) and various other lesions, such as osteoarthritis, osteoporosis, and such malignant diseases as retroperitoneal sarcoma, lymphosarcoma, and leukemia, may also result in low back pain.

Military Surgeon, Washington, D. C.

109:175-266 (Sept.) 1951. **Partial Index**

Initial Surgery of Compound Fractures and Concurrent Muscle, Nerve and Blood Vessel Injuries in Evacuation Hospital. M. E. Lichtenstein. —p. 175.
Response of T. Pallidum to Intramuscular Penicillin in Oil. R. A. Radke. —p. 191.
*Biliary Tract Emergencies in Neglected Cases and in the Aged. H. C. W. S. deBrun.—p. 192.
Redistribution Station as Therapeutic Facility. C. Buckman.—p. 194.
Spasm of Rectus Muscle. N. B. Jaffe.—p. 204.
Medical History of Russo-German War, 1941-1945: Brief Study, with Review of First-Born Official Medical History of Second World War. C. F. Mayer.—p. 207.

Biliary Tract Emergencies.—This paper concerns neglected cases of cholecystitis and acute cases occurring in elderly patients. The author includes in the neglected category those patients in whom the cholecystitis has advanced to gangrene

and possibly rupture with beginning peritonitis. He believes that rising temperature, increase in pulse rate and in toxic symptoms, and changes in the blood picture call for emergency cholecystostomy or cholecystectomy. Conservative treatment (medical decompression drainage and maintenance of metabolic and fluid balance to aid liver function) in a patient with impending rupture of the gallbladder is not good practice. In the presence of obstruction of the biliary tract with damage to the liver cells, the clinician must depend on the patient's history and on palpation. A tender gallbladder with or without rigidity and with toxemia in the aged should call for lifesaving surgery. In the surgical treatment of the poor risk patient, the author advises the conservative cholecystostomy, which relieves tension and gives adequate drainage after the removal of obstructions, stones, tumors, or adhesions, thereby often saving a patient who would not have survived cholecystectomy.

New England Journal of Medicine, Boston

245:351-388 (Sept. 6) 1951

Primary Malignant Bone Tumors: Report of 93 Cases Observed at Pondville Hospital, 1928-1949. G. White and M. Elkin.—p. 351.
Metabolic Effects of Rice Diet in Treatment of Hypertension. J. H. Currens, E. A. S. Reid, E. A. MacLachlan and F. A. Simeone. —p. 354.
*ACTH and Cortisone in Diseases of Skin. W. F. Lever.—p. 359.
Treatment of Acute Thyroiditis with Antithyroid Drugs. W. S. Reveno and H. Rosenbaum.—p. 364.
Blood Grouping, Blood Banking and Blood Transfusion. L. Soutter, F. H. Allen Jr. and C. P. Emerson Jr.—p. 367.

Corticotropin and Cortisone in Skin Diseases.—More than 70 patients with diseases of the skin were treated with corticotropin (ACTH) or cortisone. For economic reasons the intravenous administration of corticotropin was used with increasing frequency. The drug, dissolved in 500 ml. of a 5% solution of dextrose, was given by constant drip over a period of 8 hours every day when 20 mg. was given and over a period of 12 hours every day when 30 or 40 mg. was given. The average daily intramuscular dose should be 100 mg. of corticotropin in four equally divided doses every six hours at the beginning of treatment, but in severe systemic diseases the optimal daily dose is 200 or 300 mg. per day. Younger children should receive about half the adult dose and older children nearly the adult dose. The amount of intramuscularly administered corticotropin should be multiplied by 2½ for oral or intramuscular doses of cortisone, and divided by 7 for the corresponding intravenous dose of corticotropin. In selecting the dosage one must rely above all on the clinical response. Corticotropin and cortisone were found to be of considerable value in the treatment of serious, frequently fatal dermatoses, such as pemphigus, systemic lupus erythematosus, dermatomyositis, and generalized exfoliative dermatitis. In these diseases corticotropin and cortisone represent the best treatment available and may be life-saving. Either drug may be used, since in all these conditions the adrenals are capable of responding adequately. Treatment should be started as soon as possible. In chronic inflammatory nonfatal dermatoses, corticotropin and cortisone give only temporary relief, so that their administration is justified only in severely ill patients. Once started, the treatment must be continued for long periods of time. In patients who are not seriously ill the not infrequent occurrence of undesirable side-effects with prolonged treatment may be worse than the disease. Short courses of corticotropin or cortisone are indicated in acute self-limited inflammatory dermatoses, such as drug eruptions, erythema multiforme, and anaphylactoid purpura, if the symptoms are severe enough. Some cutaneous diseases, especially atopic eczema, psoriasis, and chronic discoid lupus erythematosus have a tendency to recurrence, and the disease may be worse on discontinuance of therapy than it had been before. Corticotropin or cortisone were of little value in chronic, serious dermatoses, including scleroderma and mycosis fungoides.

New Orleans Medical and Surgical Journal

104:89-130 (Sept.) 1951

Surgery in Diabetes. J. Sabatier.—p. 89.
Polyps of Colon. C. E. Boyd.—p. 92.
Bronchoscopy in Pulmonary Diseases. W. P. Pirkey.—p. 96.
Surgery of Suppurative Pulmonary Disease. L. H. Strug.—p. 99.
Emergence of New Viral and Rickettsial Diseases. J. P. Fox.—p. 103.
Health and Longevity. B. Freedman.—p. 111.

Pediatrics, Springfield, Ill.

8:309-454 (Sept.) 1951

Retroperitoneal Teratomas in Infancy and Childhood. E. E. Arnheim. —p. 309.
Absorption of α-Tocopherol and Tocopheryl Esters by Premature and Full Term Infants and Children in Health and Disease. L. J. Filer Jr., S. W. Wright, M. P. Manning and K. E. Mason.—p. 328.
Aneurysms of Sinuses of Valsalva: With Report of Case. R. E. L. Fowler and H. H. Bevil.—p. 340.
Electrocardiographic Patterns of Normal Children from Birth to Five Years of Age. G. Gros, A. Gordon and R. Miller.—p. 349.
Studies on Absorption and Distribution of Chloramphenicol. R. S. Kelly, A. D. Hunt Jr. and S. G. Tashman.—p. 362.
Syndrome of Ovarian Agenesis (Congenitally Aplastic Ovaries): Short Stature, Multiple Congenital Abnormalities and High Urinary Gonadotropins in a Two Year, Eight Month Old Female. H. K. Silver.—p. 368.
Congenital Stippled Epiphyses. G. D. Ford, M. Schneider and J. R. Brandon.—p. 380.
*Outbreak of Acute Nephritis in Adolescent Schoolboys. C. H. Kempe, R. W. Olmsted and E. C. Curnen.—p. 393.
Laboratory Aspects of Antibiotic Therapy. E. H. Spaulding.—p. 406.
Early Interest in Pediatrics in South Carolina. J. I. Waring.—p. 413.

Acute Nephritis in Schoolboys.—The coincidental occurrence of acute nephritis in four adolescent boys who were classmates in a private school appeared to be unusual and led to studies on the other boys. Seventeen other boys were also found to have hematuria. The incidence of hematuria among the 73 students in the two classes studied was 29%. Of the 21 boys with hematuria, 15 still had abnormally elevated Addis sediment counts seven weeks after the initial examination. Cultures of the nasopharynx were made on 85 students, and it was found that 11 boys did harbor hemolytic streptococci, including three of the boys with hematuria. The strains that were isolated, however, represented at least five different immunologic varieties. Determinations of antihyaluronidase, antistreptolysin O, and antistreptokinase in serum from 17 boys with hematuria and 20 without apparent hematuria revealed wide variations in titer, but no significant differences between the two groups. The occurrence of acute nephritis in groups of associated persons has been noted among soldiers, in whom it has been referred to as trench or war nephritis. It has also been encountered among adults in congested tenement buildings and in several children in families. To account for multiple cases of nephritis within a family, a familial predisposition has been suggested; and, in other groups, cold and damp surroundings and poor nutrition have been suggested as contributory factors. Since nephritis has been observed frequently after scarlet fever or other streptococcic infections, it has been suggested that nephritis may be caused by such infections.

Pennsylvania Medical Journal, Harrisburg

54:833-920 (Sept.) 1951

Diagnosis and Treatment of Hypopotassemia. W. A. Steiger.—p. 866.
Changing Concepts in Supportive Therapy of the Surgical Patient. J. D. Hardy.—p. 869.
Diet and Insulin in Diabetes. L. L. Pennock.—p. 872.

Plastic & Reconstructive Surgery, Baltimore

8:87-172 (Aug.) 1951

Experiences with Exposure Method of Burn Therapy. T. G. Blocker Jr., V. Blocker, S. R. Lewis and C. S. Snyder.—p. 87.
Application and Use of Nylon-Backing with Split-Skin Grafts. S. Glanz and H. M. Trusler.—p. 94.
Congenital Constricting Bands of Extremities. H. M. Blackfield and D. P. Hause.—p. 101.
*Local Use of Heparin in Plastic Surgery. W. W. Wong.—p. 110.
Elective Rhinoplasty. H. O. Barnes.—p. 113.
Rethi Incision in Rhinoplasty. H. May.—p. 123.
New Instruments in Rhinoplasty. H. Koechlin.—p. 132.
Temporomandibular Arthroplasty in Treatment of Prognathism. M. Gonzalez-Ulloa.—p. 136.
Use of Vitallium Prostheses and Implants in Reconstruction of Mandibular Arch. J. J. Conley.—p. 150.

Local Use of Heparin in Plastic Surgery.—The survival of a graft in the earlier stages is dependent on the nutrition of the graft from the serum bed. Not only must the graft be nourished but its waste products must be removed. In other words, there must be an exchange of tissue fluids or a movement of tissue fluids between the graft and the recipient area. The graft fails to take when this metabolic exchange does not occur. Condi-

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tions favoring failure include local thrombosis of the vessels at the recipient and graft surfaces and/or a collection of serum and blood clot between the graft and the recipient area. If venous stasis and thrombosis can be prevented, the viability of the graft can be maintained. Heparin is the ideal agent to be used here. It prevents thrombosis, aids lymphatic drainage, and improves circulation of tissues by reducing blood viscosity without affecting capillary permeability. The amount of heparin used (10 mg. per cubic centimeter) depends upon the size of the area of congestion and averages about 0.25 to 0.5 cc. This is placed with a needle inserted between the graft and the recipient area. The heparin is deposited slowly into the region, care being taken not to get it too far beyond the congested area. The regular dressing is then applied. In 24 hours, the color of the area will improve. Local use of heparin has been of value in plastic surgical procedures that require use of tube pedicle flaps, sliding flaps, or full thickness skin grafts.

Psychiatric Quarterly, Utica, N. Y.

25:379-556 (July) 1951. **Partial Index**

Differential Psychotherapy of Borderline States. V. W. Eisenstein. —p. 379.
Personality Changes After Topectomy. P. H. Hoch.—p. 402.
Psychological Observations on Psychosurgery Patients. C. Landis. —p. 409.
Persistent Organic and Psychogenic Syndrome Following Prolonged Insulin Coma. R. W. Gans and L. P. Deutsch.—p. 424.
Test Evidence of Personality Change and Prognosis by Means of Rorschach and Wechsler-Bellevue Tests on 17 Insulin-Treated Paranoid Schizophrenics. M. B. Lipton, S. Tamarin and P. Lotesta.—p. 434.
Juvenile Amaurotic Family Idiocy: Features Suggestive of Precocious Senility. R. M. Cares.—p. 445.
Psychopathology of Personality Functions in Psychopathic Personalities. F. A. Freyhan.—p. 458.
Incidence of Pulmonary Tuberculosis Among Employees in 14 Institutions for the Mentally Ill. J. Katz, R. E. Plunkett and F. MacCurdy. —p. 500.

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Psychiatry, Washington, D. C.

14:255-360 (Aug.) 1951. **Partial Index**

Characterological Significance of Typical Anxiety Dreams. I. D. Harris. —p. 279.
Remarks on Pathogenesis and Treatment of Schizophrenia. A. Szalita-Pemow.—p. 295.
Family Care: Neglected Area of Research. J. M. Stycos.—p. 301.
Treatment of Psychosis of General Paresis with Combined Sodium Amytal and Psychotherapy: Report of Case. R. S. Wallerstein. —p. 307.
Logical Status and Methodological Problems of Research in Clinical Psychiatry. G. Devereux.—p. 327.
Problems of the Self in Light of Psychopathology of Schizophrenia. D. W. McKinney.—p. 331.

Psychoanalytic Quarterly, Albany, N. Y.

20:349-510 (July) 1951. **Partial Index**

Behavior of Stomach During Psychoanalysis: Contribution to Method of Verifying Psychoanalytic Data. S. G. Margolin.—p. 349.
Psychoanalytic Approach to Mass Production. G. Pederson-Krag.—p. 434.

Public Health Reports, Washington, D. C.

66:1195-1226 (Sept. 21) 1951

Preparation of Dried Antigen and Antiserum for Agglutination-Inhibition Test for Virus Influenza. M. R. Hilleman, E. L. Buescher and J. E. Smadel.—p. 1195.
*Yolk Sac Technique for Routine Isolation of Brucella: Injection of Clotted Blood Specimens into Embryonating Eggs with Recovery of All Three Species. K. Gay and S. R. Damon.—p. 1204.
Modification of the Winter and Sandholzer Media and Technique for Enterococci Detection. Wen-Lan Lou Wang and S. G. Dunlop.—p. 1212.

66:1227-1262 (Sept. 28) 1951

Age Incidence of Specific Causes of Illness Found in Monthly Canvasses of Families—Sample of Eastern Health District of Baltimore, 1938-43. S. D. Collins, F. R. Phillips and D. S. Oliver.—p. 1227.
Changing Causes of Death in Childhood. H. A. Kahn.—p. 1246.
Coronary Occlusion with Myocardial Infarction in Young Males: Report of Four Cases. T. Levy.—p. 1248.

Yolk Sac Technique for Isolation of Brucella.—Clots from specimens of blood received for diagnostic agglutination tests were employed. Following completion of the serological test, one-half of the clot was prepared for animal and egg inoculations. A sufficient number of eggs was incubated each Monday and Friday, so that each day of the week 3-, 4-, or 5-day-old live embryos were available. Before and after injection, all eggs were kept at 36 to 37 C. Examinations consisted of two or three subcultures from the yolk at about 4-day or 5-day intervals and, in some instances, a final harvesting of all live embryos on the 18th or 19th day of total incubation. A total of 138 blood clot specimens, of which 123 were from human sources, were inoculated into embryonating eggs. Four suis strains were recovered from the 15 animal clots included in the study. The 123 human clots were further examined by enrichment in broth and 95 of them by guinea pig inoculation. Twenty-seven clots, upon injection into the eggs, resulted in a heavy contamination and rapid death of the embryos. Thus, only 96 specimens were considered satisfactory for egg inoculations, and from this number 14 recoveries—1 melitensis, 4 suis, and 9 abortus—were made, with the egg technique yielding all but one suis strain. From these same 96 specimens the guinea pigs yielded one Brucella strain and the broth, six. Eleven isolations came from patients with acute symptoms at the time of collecting the specimens, while the other three were from asymptomatic patients. No recoveries were made from patients with chronic complaints. All isolations came from persons with agglutination titers of at least a 1:80 serum dilution. The egg embryo yolk sac technique is recommended because: (*a*) it provides living tissue cells in a compact medium; (*b*) it permits recovery of all three types of Brucella; (*c*) it gives comparatively quick results; and (*d*) it entails a minimum amount of danger for laboratory personnel.

Quarterly J. Studies Alcohol, New Haven, Conn.

12:355-562 (Sept.) 1951

Effect of Acute Alcohol Intoxication on Adrenal Glands of Rats and Guinea Pigs. J. C. Forbes and G. M. Duncan.—p. 355.
Psychosis During Treatment of Alcoholism with Tetraethylthiuram Disulfide. J. Guild and N. B. Epstein.—p. 360.
*Further Clinical Experience with Tetraethylthiuram Disulfide in Treatment of Alcoholism. N. B. Epstein, J. Guild and E. Davidoff.—p. 366.
Treatment of Alcoholism by Nutritional Supplement. J. A. Smith, P. A. Dardin and W. T. Brown.—p. 381.
Alcoholism and Lobotomy. B. Talbot, E. C. Bellis and M. Greenblatt. —p. 386.
Newsletter for Alcoholics: Program of Continued Treatment and Social Service Follow-Up of Alcoholic Patients Discharged in Rural Area. D. M. Wayne and E. R. Phillips.—p. 395.
Life History of an Ex-Alcoholic: With Evaluation of Factors Involved in Causation and Rehabilitation. E. Hanfmann.—p. 405.
Studies of Drinking in Jewish Culture. S. D. Bacon.—p. 444.
Educational Characteristics of Alcoholics: Some Critical Comments. E. M. Lemert.—p. 475.
Problem of Value in Study of Alcoholism. D. A. Stewart.—p. 489.
Problems of Alcoholism as Related to Health Education in Secondary Schools: Panel Discussion. M. A. Block, D. C. Duttweiler, O. Milich and others.—p. 495.

Tetraethylthiuram Disulfide in Alcoholism.—This report reviews observations on 125 patients (including 55 previously reported) who were treated with tetraethylthiuram disulfide and have been under observation for from several weeks to 15 months. Tetraethylthiuram disulfide was found to be an effective weapon in the medical armamentarium presently available to combat alcoholism, but it is only one of several factors. Extreme caution is necessary in patients who have cardiac or cardiovascular disease. Changes in the differential leukocyte count deserve further investigation. Electroencephalographic studies indicate that tetraethylthiuram disulfide has some central sedative action, which explains why most patients show some somnolence. At the end of 15 months of therapy, 50% of patients who had previously failed in other therapeutic attempts, including Alcoholics Anonymous, showed improvement ranging from slight to complete social recovery. The pattern of changes after the first three months of therapy, and definitely after six months, showed a tendency toward either loss of contact with the clinic and no change or readjustment and social recovery. Faced with the anxiety of increasing inadequacy of adjustment, most alcoholics revert to drinking before breakdown and psychosis appear. The authors believe that this treatment should be carried out by nonpsychiatric medical practitioners under psychiatric guidance. The initial stages of therapy may be most effectively handled at a psychiatric outpatient unit, and after the reaction session the patient should be referred to his family physician for further care. Tetraethylthiuram disulfide may be administered on an outpatient basis with satisfactory results.

FOREIGN

British Journal of Surgery, Bristol

39:1-96 (July) 1951

Extrathecal Haemangiolipomas of Spinal Canal. J. Taylor, B. J. Harries and P. H. Schurr.—p. 1.
Pituitary Tumours: Observations on Large Tumours Which Have Spread Widely Beyond the Confines of Sella Turcica. H. C. Trumble.—p. 7.
Metastasizing Goitre: "Hürthle Cell" Tumour of Thyroid and Skull. R. C. Shaw.—p. 25.
Bone-Bank in Neurosurgery. H. Elliott and H. J. Scott.—p. 31.
Endo-Aneurysmorrhaphy: Report of Three Cases of Non-Traumatic Aneurysm so Treated. L. Rogers.—p. 35.
*Congenital Absence of Gall-Bladder: Cholangiography: Gall-Stone Solvents. A. J. H. Rains.—p. 37.
*Fate of Tumour in Infantile Hypertrophic Pyloric Stenosis. G. Armitage and J. A. Rhind.—p. 39.
*Annular Pancreas. J. R. Anderson and H. Wapshaw.—p. 43.
*Annular Pancreas. B. J. Bickford and J. C. F. L. Williamson.—p. 49.
Leiomyosarcoma of Pancreas. C. F. Ross.—p. 53.
Oligodendroglioma with Extracranial Metastases. T. G. I. James and W. Pagel.—p. 56.
Use of Modified Miller-Abbott Tube in Treatment of Duodenal Fistula. A. M. N. Gardner.—p. 65.
Perforation of Adenocarcinoma of Ileum. P. Somerville.—p. 71.
Chondrosarcoma of Ilium Complicating Hereditary Multiple Exostoses. R. S. Monro and J. S. R. Golding.—p. 73.
Acute Diverticulitis of Caecum and Ascending Colon. D. R. K. Reid. —p. 76.
Case of Traumatic Uraemia. H. N. Green, H. B. Stoner, H. J. Whiteley and D. Eglin.—p. 80.

Congenital Absence of Gallbladder.—A woman, aged 61, was hospitalized with a provisional diagnosis of acute cholecystitis. Her attacks of subcostal pain on the right side had recently become more frequent and severer, and she was advised to have her gallbladder removed. Repeated cholecystograms failed to reveal a shadow of the gallbladder. Laparotomy revealed a normal-sized liver but no gallbladder, its fossa being represented by a deep fissure. A membrane extended from the anterosuperior aspect of the first part of the duodenum to the porta hepatis; it appeared to be continuous with the lesser omentum on the left. The common duct and portal vein were behind it. This membrane was divided and revealed an enormously dilated common duct. Many calculi could be felt in it. Eight mixed calculi were removed from the hepatic ducts above and two smaller ones from the common duct below. Ether was used to dissolve remaining stones or biliary sludge. Its use and dangers as a solvent for gallstones is discussed; it probably will never replace surgical removal, but it may be helpful in removing the overlooked stone, if it is discovered before drainage tubes are removed. Cholangiography was used postoperatively in the woman whose case is reported, to demonstrate the absence of an intrahepatic gallbladder, any remaining stones in the ducts, and the free pathway for bile into the duodenum. Information on this subject by other writers is summarized, including previous reports of 71 patients with congenital absence of the gallbladder.

Infantile Hypertrophic Pyloric Stenosis.—The Fredet-Ramstedt operation of pyloromyotomy is now firmly established in the treatment of infantile hypertrophic pyloric stenosis The patient reported on was treated before Ramstedt introduced his operation. She was born in September, 1909, and was subjected to a posterior gastrojejunostomy in November of the same year. As a child she could not eat as much as other children, but was apparently normal except for discomfort after a heavy meal. In 1935 she began to have vague indigestion, but a barium meal examination revealed a normal gastrojejunostomy. The discomfort was diagnosed as recurrent appendicitis, and the appendix was removed. It was found to be kinked, infected, and adhering to the outer side of the cecum. The symptoms were unrelieved following appendectomy. In April, 1950, the patient had an attack of severe acute abdominal symptoms, which necessitated opening of the abdomen by a right paramedian incision. No lesion was found until the duodenojejunal flexure was reached, where a perforated jejunal ulcer was discovered. Re-examination of the pyloric region revealed gross thickening of the pyloric canal, the appearance being identical with that seen at operation on infants with congenital pyloric stenosis; the patency of the pylorus seemed so doubtful that it was felt safer to perform partial gastrectomy than a simple closure of the perforation. Following subtotal gastrectomy with precolic gastrojejunostomy, progress was uneventful. The surgical specimen revealed an old congenital hypertrophic pyloric stenosis, neonatal posterior gastrojejunostomy, a tiny submucous focus of suppuration, and mucosal atrophy. The literature contained reports of 11 cases of this type, in all of which hemorrhage was the major feature. Dyspeptic symptoms were unusual, and in many cases jejunitis rather than a chronic jejunal ulcer was reported. This case of perforation brings the number to 12. The results of medical treatment are difficult to evaluate, but it is thought that if the infant can be kept alive, spontaneous relief of symptoms occurs within a few months, and the exponents of medical treatment claim a high percentage of cures. Why the pyloric tumor should persist after gastrojejunostomy and regress after medical treatment is not clear, but the persistence of the tumor must be explained by any future theory concerning the nature of infantile hypertrophic pyloric stenosis.

Annular Pancreas.—The authors report a case of annular pancreas in a woman, aged 52. The presenting symptom was jaundice, apparently due to pressure on the lower end of the common bile duct by the inflamed pancreatic annulus. Partial resection of the ring was followed by freedom from symptoms.

Annular Pancreas.—The symptoms in the 25-year-old man whose case is reported suggested total obstruction of the second part of the duodenum. The etiology was unknown, and it was not possible to arrive at a positive diagnosis, but the presence of some congenital abnormality was postulated, possibly a duodenal mesentery, with partial obstruction made complete by the huge distention of the stomach. Laparotomy revealed a small amount of free fluid in the peritoneal cavity, with some edema of the greater omentum. The entire pancreas was enlarged, hard, and nodular, and a ridge of hard tissue extended to the right in front of and around the second part of the duodenum, causing obstruction in this region. The process was thought to be carcinomatous. A posterior gastrojejunostomy was performed, and convalescence was uneventful; symptoms were completely relieved. On further consideration and in view of the patient's very good general condition, it was thought that he had chronic inflammation in an annular pancreas rather than carcinoma. This diagnosis is confirmed by the fact that he has remained well since the operation. The literature on annular pancreas is briefly reviewed. The condition can easily be missed before, or even at, operation, and it is probable that the incidence is higher than the recorded number of cases suggests. Gastrojejunostomy is probably the best method of treatment, but, if the constriction ring is thin and easy of approach, it may be divided instead. With operation the prognosis is relatively good.

British Medical Journal, London

2:623-688 (Sept. 15) 1951

Action of Certain Drugs on Respiration. G. Liljestrand.—p. 623.
Neural Control of Pituitary Gland: II. Adenohypophysis, with Special Reference to Secretion of A.C.T.H. G. W. Harris.—p. 627.
Comparative Action of E. C. T. and of Pituitary Anterior Lobe Hormones on Thyroid Function. M. Reiss, R. E. Hemphill, R. Maggs and others.—p. 634.
Anaemia of Rheumatic Fever. J. B. Cochran.—p. 637.
Incidence of Congenital Malformations and Their Relation to Virus Infections During Pregnancy. W. P. D. Logan.—p. 641.
*Tromexan and Dicoumarol. D. G. Illingworth.—p. 646.
Dosage of Penicillin in Weil's Disease. C. W. Lawson.—p. 648.
Ergot Poisoning at Pont St. Esprit. Gabbai, Lisbonne and Pourquier. —p. 650.

Ethyl Biscoumacetate and Bishydroxycoumarin.—Anticoagulants were given to 130 patients with vascular thrombosis and its sequelae. Of the 130, ethyl biscoumacetate (tromexan*) was given in tablets of 300 mg. to 60 with cardiac infarction and 12 with extracardiac thrombosis. A loading dose of 1,200 mg. proved safe and became standard, although 2,100 mg. was given twice without incident. Between 12 and 24 hours after starting treatment, and before more ethyl biscoumacetate was administered, a prothrombin concentration test was performed; 70% of the patients were observed to have less than 50% prothrombin and 34% had entered the therapeutic range of 10 to 30% prothrombin. Usually the necessary maintenance dose lay between 300 and 600 mg. There were pronounced variations in suscepti-

bility to ethyl biscoumacetate. A given patient's tolerance may alter widely from day to day, and there is a tendency to sudden escapes from control. It is therefore not desirable to give the drug without laboratory control. No correlation of dosage with weight or age is possible, but an initial prothrombin reading may assist in gaging the size of the loading dose. Of the 60 patients with cardiac infarction, 51 left the hospital with an end result regarded as satisfactory, and 9 died in the hospital. The fatal cases, with the exception of one patient who was inadequately treated, were poor risks. Of the 12 patients with extracardiac thrombosis, the end result was regarded in all as satisfactory. Bleeding incidents occurred in 2 of the 72 patients treated with ethyl biscoumacetate; both suffered a hematemesis from a clinically active duodenal ulcer, but neither required any more active treatment than discontinuation of the drug. Caution is necessary in treating peptic ulcer patients. Benzidine tests on the feces may be helpful in the control of their treatment. Fifty-eight patients, 36 with cardiac infarction and 22 with extracardiac thrombosis, were treated with bishydroxycoumarin (dicumarol®). Of the 36 patients, 29 left the hospital, the immediate end result being satisfactory; 7 patients died. Of the 22 patients, 19 left the hospital with an end result regarded as satisfactory, and 3 died. Of the total of 58 patients, 13 had hemorrhagic complications. All received intravenous vitamin K, and three required transfusion. Ethyl biscoumacetate is superior to bishydroxycoumarin. As it has a shorter "lag period" the use of heparin may be either obviated or restricted to a single intravenous dose. The clinical results compare favorably with those of bishydroxycoumarin therapy. Hemorrhagic complications are not only less frequent but much less severe. A fall in prothrombin concentration below 10% was not regarded as serious in the ethyl biscoumacetate-treated group.

Deutsche medizinische Wochenschrift, Stuttgart

76:1133-1164 (Sept. 14) 1951. **Partial Index**

Present Status of Mortality from Tuberculosis with Regard to Age and Sex in Germany and in Several Other Countries. F. Ickert and A. Keutzer.—p. 1133.
Damage to the Liver Produced by Amithiozone. H. Hörlein.—p. 1139.
*Formal Pathogenesis of Boeck's Disease. H. Hartweg.—p. 1144.
Ambulatory Chemotherapy in Tuberculosis. R. Griesbach.—p. 1146.
Practical Aspects of Subcutaneous Infusion of Paraaminosalicylic Acid. G. W. Lauenstein and W. Rockstroh.—p. 1148.
Chemotherapy in Pulmonary Tuberculosis Complicated by Diabetes Mellitus. K. J. Irskens.—p. 1150.
Penicillin in Treatment of Pleural Exudate Accompanying Pulmonary Tuberculosis. E. Lehmann.—p. 1151.

Pathogenesis of Boeck's Sarcoid.—An attempt is made to clarify the pathogenesis of Boeck's sarcoid on the basis of observations in 70 cases. The problem of etiology is disregarded. In earlier reports the author discussed the course of the pulmonary lesions of Boeck's sarcoid and the significance of this localization for the disease in general. In these earlier studies it was found that the lungs are more frequently involved than is any other organ. The pulmonary lesion usually begins with a swelling of the hilar lymph nodes, which is usually bilateral. This stage is followed by miliary dissemination into the lungs, which may be preceded by the appearance of a fine reticulation. Then follows a more or less severe fibrosis of the pulmonary interstitial tissue through hyalinization of the lymph channels. As a rule, this completes the process in the lungs, but there may be a fourth stage, which takes the form of an indurating infiltration, and a fifth or nodular stage. The author further discusses the time relationship between the various stages of the pulmonary lesions and the involvement of other organs, particularly the lymphatic system, and the eyes, bones, and skin. In contradistinction to Schaumann, he regards the lungs as the portal of entry for the disease. Although the first demonstrable lesions occur in the hilar nodes, the lungs may become involved subsequently by retrograde lymph flow from the hilar region or by way of the blood stream during generalization of the process. It is assumed that the extrapulmonary organic foci develop during the second stage of the pulmonary process. The apparent difference in the time of their appearance can be explained by the specific differences in the organs involved. Subsequently, the lesions in the different locations follow a development according to their own individual characteristics.

Lancet, London

2:457-504 (Sept. 15) 1951

The Patient and the Physician. J. Parkinson.—p. 457.
Mechanism and Physiotherapeutic Relief of Pain. C. Shields.—p. 459.
*Ulcerative Colitis: Diagnostic Problem and Therapeutic Warning. B. N. Brooke and W. T. Cooke.—p. 462.
Tuberculin Sensitivity of Children in North-East Scotland: Mantoux and Tuberculin-Jelly Reactions Compared in 1499 Patients. N. S. Clark.—p. 464.
Serum-Creatine in Disease of Thyroid. W. J. Griffiths.—p. 467.
*Effect of Hexamethonium Bromide in Arterial Hypertension. L. Werkö, A. R. Fisk, G. Wade and H. Eliasch.—p. 470.
Streptomycin Treatment of Haemophilus Influenzae Meningitis Complicating Primary Atypical Pneumonia. A. Dolphin and R. D. Popham.—p. 472.
Primary Carcinoma of Peripheral Bronchi. C. Raeburn.—p. 474.
Genital Tuberculosis with Pulmonary Involvement: Observations on Incidence and Treatment. D. T. O'Driscoll.—p. 476.
Protein Shock from Intravenous A.C.T.H. L. A. Wilson.—p. 478.
Work on the Land: Its Potentialities for Resettlement of the Disabled. G. H. Dobney.—p. 492.
Cancer Education of the Public. R. W. Raven and J. Gough-Thomas.—p. 495.
Publicity in Cancer. O. D. Beresford and T. A. Watson.—p. 496.

Ulcerative Colitis.—In selecting patients with colitis for surgical treatment it is important that the clinical entity of ulcerative colitis be clearly defined. The authors regard as ulcerative colitis in the restricted sense of the term the lesion centered in and severest in the descending colon. Right-sided ulcerative colitis may be a disease separate from the usual form, with maximal disorganization on the left. Right-sided colitis is possibly secondary to an ileal lesion. The entire colon can become involved, and the disease can thus be confused with left-sided colitis. The treatment of the two types is different, because the usual forms of surgical treatment for ulcerative colitis, involving ileostomy or ileosigmoidostomy, have disappointing results when used for the right-sided disease. It is therefore necessary to ascertain that the disease is limited to the colon before such operations are considered. The discovery of the right-sided type of colitis should always raise suspicion of an ileal lesion, but this may even be present when the whole colon is diseased. A progress meal with nonflocculating colloidal solution of barium gives the best chance of observing the "sawtooth" appearance in the ileum or an area devoid of the usual contractions and dilations. A fat-balance test may indicate a failure of absorption, and a macrocytic anemia, abnormality of serum protein levels, or severe glossitis may be further indications of ileal dysfunction, although they are not always present. The discovery of an ileal lesion is a contraindication to operations designed to divert the fecal stream from the colon, with or without excision of the large bowel, for there is a strong tendency for the disease to become manifest above the ileostomy, or, in the case of ileosigmoidostomy, above and below the anastomosis. In such cases vagal section may provide relief.

Effect of Hexamethonium Bromide in Arterial Hypertension.—This paper reports the effects of hexamethonium bromide in hypertensive patients and compares them with those of tetraethylammonium bromide. Studies were made on 30 hypertensive patients with a blood pressure persistently above 160/100 mm. Hg. The spontaneous daily variations in blood pressure were assessed over 24 hours, and then the responses to the following drugs were tested: amobarbital (amytal®) sodium and intravenously administered tetraethylammonium bromide and hexamethonium bromide. It was found that hexamethonium bromide caused a greater fall in systemic blood pressure than did either amobarbital or tetraethylammonium bromide. The authors consider 0.2 mg. per kilogram of body weight the largest intravenous dose of hexamethonium bromide that can be given safely. Catheterization in three cases showed a fall in pressure in the pulmonary capillaries and in the pulmonary artery, a decrease in the cardiopulmonary blood volume, and (in two of the three cases) a fall in cardiac output. These changes may be due to pooling of blood in the systemic circuit. Hexamethonium bromide is from 25 to 35 times as potent as tetraethylammonium bromide and is longer-acting. There is a considerable variation in response to hexamethonium bromide, both from case to case and in the same case from time to time.

Medical Journal of Australia, Sydney

2:69-100 (July 21) 1951. **Partial Index**

Paediatric Psychiatry: Its Scope and Limitations. J. F. Williams.—p. 76.
Colostomy Closure. T. E. Wilson.—p. 79.
Vaginal Delivery After Previous Caesarean Section. W. I. Hayes.—p. 82.

2:101-136 (July 28) 1951. **Partial Index**

Outline of Control of Non-Specific Urinary Tract Infections. D. B. Duffy.—p. 107.
Polycystic Disease of Kidneys. J. B. Cleland.—p. 109.
Enuresis and Toilet Training. J. Bostock and M. G. Shackleton.—p. 110.
Primary Glaucoma. H. C. Beckett.—p. 113.
Use of 12-Volt Ultra-Violet Bulb for Diagnosis of Ringworm Infections of Scalp. M. Havyatt.—p. 115.
Angiocardiography. M. L. Powell and H. G. Hiller.—p. 116.
Treatment of Acute Leuchaemia by Folic Acid Antagonists. J. A. McLean.—p. 119.
Chloroma. F. G. Fenton and H. Ryan.—p. 83.
Case of Progressive Subcutaneous Gangrene of Spontaneous Origin. N. L. Newman.—p. 86.

Minerva Chirurgica, Turin

6:311-348 (June 15) 1951. **Partial Index**

*Five Cases of Cerebral Arteriovenous Aneurysm Treated by Ligation of Carotid Artery. P. E. Maspes and G. Kluzer.—p. 311.
Jacksonian Epilepsy Due to Extracortical Pseudoporencephaly. G. Kluzer and F. Marossero.—p. 320.
Rare Case of Acquired Inguinointerstitial Hernia Simulating Spontaneous Ventral Hernia. C. Di Maggio.—p. 323.
*Massive Hemorrhages Associated with Extrapleural Pneumothorax. G. Bardesono.—p. 326.
Cirrhosis of Liver in Ex-Prisoners of War (Japan): Preliminary Communication. E. G. McQueen.—p. 122.

Ligation of Carotid Artery in Cerebral Arteriovenous Aneurysm.—Ligation of the common carotid artery was performed in three male patients, 11, 23, 40 respectively, and in a woman, 27, with cerebral arteriovenous aneurysm. Ligation of the common and of the internal carotid arteries was performed in a man, 35, who also had cerebral arteriovenous aneurysm. The first symptoms consisted of one or more episodes of subarachnoid hemorrhage in three patients, cerebral hemorrhage in one patient, and convulsive attacks in the other. Focal signs were present in all cases and made it easier to determine from which side the diagnostic arteriography was to be performed. Total removal of the aneurysm was deemed impossible, because its location implied severe risks. Prior to ligation the carotid artery was occluded for 20 minutes with Matas' compressor to determine whether any serious symptoms would appear. The artery was then ligated but not sectioned. Electroencephalograms were taken in two patients before, during, and after the ligation. Immediate and late complications were not observed in any case. There was regression of the neurological symptoms, and hemorrhages did not recur, not even in the woman in whom they had always occurred with menstruation. Two years after the operation the boy is well and leads a normal life, the woman has resumed her work as a teacher, and conditions in the other three patients are still unchanged. The definite effectiveness of the ligation of the carotid artery has not yet been proved. If it causes a diminution of the circulation with resulting injuries to the nervous parenchyma, it should be omitted. Also, it would be useless in instances of cerebral arteriovenous aneurysm in which disturbances are not present and a good circulation is therefore presumed. However, the good results obtained in the last years justify the assumption that ligation of the carotid artery may be beneficial in some cases of cerebral arteriovenous aneurysm.

Massive Hemorrhages Associated with Extrapleural Pneumothorax.—An investigation was made in an attempt to establish the cause of massive hemorrhages associated with extrapleural pneumothorax. These hemorrhages may occur during the surgical intervention owing to the rupture of a vessel, in which case they are easily controlled; or they may occur 24 to 48 hours after the operation as a result of a vasomotor reaction. In this case formation of hematoma and perforation may result. According to the author, these hemorrhages are attributable to an erroneous indication for the extrapleural pneumothorax. He performed this operation in 200 patients with tuberculosis. Massive hemorrhage developed in 10 (5%) of them, and the postoperative course proved that there had been an incorrect indication for this intervention. Of these 10 patients, 6 had medium-sized tuberculous lesions localized in the upper right lobe. The remaining four had the exudative type of lesion, but the extrapleural detachment was difficult because of tenacious adhesions. They were, therefore, instances in which thoracoplasty would have been justified. The reason for massive hemorrhages in cases of erroneous indication may be easily understood if one considers the anatomic changes (fibrosclerosis, vascular neoplasms, inflammatory hyperemia) that are present in the pleuropulmonary and in the pleuromuscular areas in cases of tuberculosis of long duration. Thoracoplasty is, in general, indicated in the presence of old lesions. Often, however, clinical, roentgenologic, and anamnestic data are insufficient for the physician to determine the date of onset of the disease, so that the apparent indications are erroneous. In case of massive hemorrhage caused by the rupture of a vessel, hemostasis is the treatment of choice, even if it implies a second intervention. In instances of a massive hemorrhage caused by a vasomotor factor, the blood should be aspirated, and irrigation with hot water combined with administration of epinephrine hydrochloride should follow. If fibrin deposit has already occurred, making lavage impossible and insufficient, costal drainages should be performed to remove the deposit. Then, if necessary, thoracotomy and injections of penicillin, streptomycin, paraaminosalicylic acid, and sulfones should follow to prevent secondary infection and chronic empyema.

Ophthalmologica, Basel

122:129-192 (Sept.) 1951. **Partial Index**

Contribution to Etiology of Pseudoglaucoma (Pseudoglaucoma and Hypotension of Intracranial Fluid). J. Štajduhar.—p. 129.
*Papilloretinitis After Vaccination with BCG. L. Gát and L. Mándi.—p. 143.
Biologic Significance of Pigmentation of Mesenchymal Tissues of Eye. R. Sondermann.—p. 166.
Physiological Foundations of Depth Vision. E. Fleischer.—p. 172.
Rigidity of Cornea in Glaucoma Without Intra-Ocular Hypertension. R. Weekers.—p. 187.

Papilloretinitis.—In examining a large number of tuberculous patients in 1947 and 1948, Gát had observed typical tuberculous changes in the papilla and the surrounding retina. The nasal side of the papilla appeared washed-out and edematous, the edema extending to the surrounding retina to a width of about half that of the papilla. The other parts of the papilla were intact, but the blood vessels were slightly dilated. Subsequently, most of the changes subsided, but connective tissue proliferated along the veins. At first Gát regarded this form of papilloretinitis as a toxic symptom, since the majority of the patients whom he examined at that time had severe pulmonary tuberculosis. Subsequently, however, Gát and Mándi found this phenomenon also in benign forms of tuberculosis. The transitory and recurrent nature of the changes and the pathohistological aspects (exudative and productive phase of allergic inflammation) suggested that papilloretinitis was an allergic rather than a toxic phenomenon. Complaints of headaches, vertigo, gastrointestinal disturbances, articular pains, and neurological symptoms suggest that allergic reactions occur also in other organs. On further investigation the authors found tuberculoallergic retinitis in 14 of 110 persons who had no complaints. Seven of these, who had no active pulmonary lesions, were tested with tuberculin. Five gave a positive, one a doubtful, and one a negative reaction. Of 25 patients who originally had negative tuberculin tests and had no changes in the eyegrounds, 15 showed a new papilloretinitis from 8 to 12 weeks after vaccination with BCG. In 12 of the 15 the tuberculin test was repeated and showed positive results in all. This proves a definite connection between the appearance of papilloretinitis and a tuberculous allergy. Since the tuberculous allergic papilloretinitis is present in miliary tuberculosis, in basal meningitis, in widespread cavernous phthisis as well as in benign forms of primary infection, and in those who have only been vaccinated with BCG, it is not a characteristic symptom of tuberculous meningitis, or a specific toxicosis, but is a temporary sequel of tuberculous allergy.

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41:373-388 (Sept. 8-15) 1951

Place of Ferrosoferric Complex of Ascorbic Acid in Treatment of Ulcer Disease. J. J. Dubarry.—p. 373.
Sex Cycle and Blood Coagulation. A. Fiehrer and G. H. Lavergne. —p. 376.
*Temporary Hemiplegia Due to Hypoglycemia: Localizations of Neuroencephalic Effects of Hypoglycemia; Sugar Therapy in Neurology and Neuropsychiatry. J. Albert-Weil.—p. 380.

Temporary Hemiplegia Due to Hypoglycemia.—An emaciated woman, aged 46, with pronounced psychasthenia of long duration, wanted to gain weight. Her physician prescribed a subcutaneous injection of 30 to 32 units of protamine zinc insulin every evening before supper and a diet rich in sugar, flour, and pastries. One hour after the first injection of protamine zinc insulin the patient sweated profusely, her vision was disturbed, there was a tendency to obnubilation, and a sensation of excessive hunger. The disturbances subsided rapidly after the ingestion of large amounts of sugar and carbohydrates. The next morning she had a vague feeling of discomfort and hunger, which again subsided after the ingestion of sugared food. She did not receive an insulin injection that evening, but during the night right hemiplegia developed with Babinski's sign. She was conscious, had no pain, and her temperature was normal. After the ingestion of eight lumps of sugar the paresis completely subsided and Babinski's sign disappeared. On examination several days later she was perfectly normal. The author stresses the polymorphism of hypoglycemic manifestations, the complexity of their pathogenesis, and the difficulty presented by their neurocerebral localization. The delayed effect of protamine zinc insulin in the author's case suggests that this drug should not be used in nondiabetic emaciated persons in treatment to increase their weight. The hypoglycemia undoubtedly affected the motor pathways and particularly the pyramidal fasciculi. Since hypoglycemia due to insulin largely reduces the oxygen consumption by the brain, the author suggests that in certain neurocerebral conditions, such as asphyxia, carbon monoxide poisoning, stroke due to cerebral softening or cerebral hemorrhage, encephalitis, multiple sclerosis, and schizophrenia, treatment should consist of continued administration of large amounts of sugar combined with ordinary insulin, vitamin B_1 and its derivatives (cocarboxylase), and certain "glycoformative" amino acids, such as glutamic acid. Inhalation of oxygen and carbon dioxide may be used if necessary.

Practitioner, London

167:211-304 (Sept.) 1951. **Partial Index**

Smallpox Immunization. E. T. Conybeare.—p. 215.
Diphtheria Immunization. A. H. Gale.—p. 228.
Whooping-Cough Immunization. W. C. Cockburn.—p. 232.
Measles Immunization. M. Mitman.—p. 237.
Typhoid Immunization. J. Bamforth.—p. 241.
Tetanus Immunization. L. Cole.—p. 247.
Immunization and Air Travel. K. G. Bergin.—p. 252.

Prensa Médica Argentina, Buenos Aires

38:1927-1986 (Aug. 3) 1951. **Partial Index**

Scarlet Fever in Nursing Infants. I. R. Steinberg and H. Lefevre.—p. 1937.
*Treatment of Herpes Zoster with D.H.E. 45. A. Caporaletti.—p. 1942.
Rehabilitation of the Hemiplegic. E. A. Rottjer and M. C. Lascalea. —p. 1946.

Treatment of Herpes Zoster with Dihydroergotamine.—Caporaletti treated 16 patients with herpes zoster with dihydroergotamine (DHE 45). Doses consisted of 0.5 cc. daily for children and 1 cc. daily for adults, for periods of from 2 to 16 days. Ergotamine and its derivative, dihydroergotamine, which act upon the sympathetic nervous system, represent the first truly effective remedy for herpes zoster, in which sympathetic factors are associated with a virus infection. The sympathicolytic and adrenolytic properties of dihydroergotamine are more pronounced than those of ergotamine, but unlike ergotamine it has no uterotonic action. In one of the author's cases, the patient was 7½ months pregnant and was given 1 cc. of dihydroergotamine daily for six days without any untoward effects.

Quarterly Journal of Medicine, Oxford

20:93-204 (April) 1951

*Subacute Bacterial Endocarditis: Review of 442 Patients Treated in 14 Centres Appointed by the Penicillin Trials Committee of the Medical Research Council. J. E. Cates and R. V. Christie.—p. 93.
Chronic Monocytic Leukemia. J. W. Beattie, R. M. E. Seal and K. V. Crowther.—p. 131.
Effect of Tobacco on Lung-Volume. A. G. W. Whitfield, W. M. Arnott and J. A. H. Waterhouse.—p. 141.
Uraemia Complicating Low Salt Treatment of Heart Failure. A. B. Black and J. A. Litchfield.—p. 149.
Heart Failure in Acute Nephritis. C. E. Davies.—p. 163.
Carcinoma of Bronchus: Clinical and Pathological Survey of 866 Cases. C. C. Bryson and H. Spencer.—p. 173.
Megaloblastic Anaemia of Pregnancy and the Puerperium: Review of 45 Cases with Special Reference to Their Response to Treatment. R. B. Thompson and C. C. Ungley.—p. 187.

Subacute Bacterial Endocarditis.—Between 1945 and 1948 a total of 442 patients with subacute bacterial endocarditis were treated with penicillin under a scheme organized by the Medical Research Council of Britain. The ages of the patients ranged up to 74 years, but nearly two-thirds were less than 35. Although the sexes were equally affected, disease of the mitral valve alone was almost twice as common in females as in males, whereas disease of the aortic valve alone was five times commoner in males than in females. The underlying heart lesion was congenital in 13% of the patients. The sex incidence of congenital lesions was equal, but ventricular septal defect was commoner in the male and patent ductus arteriosus was commoner in the female sex. The infecting organism was an α-hemolytic streptococcus in 87% of the cases. A dental focus of infection or a history of dental extraction was present in 48% of a representative group of 215 cases. The results of the trials of the Research Council suggest that the minimum dosage should be 2,000,000 units of penicillin daily for four to six weeks. Patients who relapsed did so within a month after the end of treatment in over 90% of the cases. After six months of apparent cure, the risk of delayed relapse or reinfection is 2% per year. There was a major arterial embolism in 35% of the cases, and in half of these it was cerebral. Coronary embolism was recognized in 2% of cases during life and was found in 13% of the autopsies. Valves were stained for organisms in 60 cases in which patients died with the infection apparently controlled; organisms were seen in 39 of these and were viable in 19. Of the 408 patients who had positive blood cultures before treatment, 14.5% died during treatment and an additional 27.4% died in the first six months after treatment; in subsequent years, an average of only 4% of survivors died each year. The 34 patients with negative blood cultures had evidence of bacterial infection, for fever responded to penicillin in 25, and in one-half of those who came to autopsy organisms were found on the heart valves. Only six patients were cured. This low proportion was due in part to the high incidence of heart failure and in part to inadequate treatment. It is suggested that this type of patient may need a larger daily dose of penicillin than patients with positive blood cultures.

Radiologia Medica, Turin

37:433-528 (June) 1951. **Partial Index**

Possibility of Axial-Transverse Tomography with Partial Rotation. L. Oliva.—p. 433.
Morphological and Functional Observations in Dolichosigmoid. G. Lischi. —p. 445.
*Primary Tumors of Lung and Atelectasis: Roentgenographic Aspects. C. Scarinci.—p. 461.

Diagnosis of Primary Cancer of Lung.—Clinical diagnosis of primary cancer of the lung is very difficult because of its polymorphism simulating pleuropulmonary tuberculosis, abscess of the lung, bronchial stenosis, pleuropulmonary sclerosis, and other conditions. Roentgen shadows that could be considered as characteristic of cancer of the lung have never been observed, and direct visualization of this neoplasm is rare. Therefore, the roentgenologic investigation should include tomographic and bronchographic studies. The author believes that bronchography is the most important aid in the roentgen diagnosis of primary cancer of the lung. If both the roentgenographic and bronchographic studies reveal the presence of stenosis of the bronchi and of secondary atelectasis, diagnosis of cancer is strongly sug-

gested, because in 80% of the cases the tumor originates in the bronchi. An endobronchial sound is indispensable for carrying the contrast medium as far as possible within the bronchus for exploration. If the medium is injected slowly, it is possible to follow on the screen its course in the bronchial tree. Arrest of the medium reveals the presence of endobronchial stenosis or compression of the bronchus by a neoplastic process outside of the bronchus. As a rule atelectasis is always an early manifestation of an early endobronchial tumor, so that surgical intervention is feasible. When roentgen therapy has failed, pulmonary surgery has given gratifying results, and for this reason early diagnosis of cancer of the lung is very important. The author presents bronchograms of four patients with cancer of the lung that demonstrate the fundamental importance of this roentgenologic method.

Revista Clínica Española, Madrid

41:147-226 (May 15) 1951. **Partial Index**

*Observations on Sarcoleukosis. G. Paniagua, M. Morales Pleguezuelo and C. Jiménez Díaz.—p. 153.
*Treatment of Hypothyroidism with Halogen Proteins. L. de Gennes, G. Deltour, and I. Benzecry.—p. 182.

Observations on Sarcoleukosis.—The authors studied 12 cases of acute leukemia with lymphosarcomatous cells, which they call sarcoleukosis. They state that this is the most frequent form of acute lymphatic leukemia, especially in childhood. It may appear as part of generalized lymphosarcomatosis, or as an acute process apparently of primary origin. Diagnosis depends on the recognition of a cell, the sarcoleukocyte, which is found in the blood, the marrow, and all the affected organs. Sarcoleukosis is accompanied by specific tumors, which may precede the appearance of the leukemia or may occur simultaneously with it. The authors state that this type of leukemia may be the one most closely resembling the spontaneous leukemias of animals or that caused by inoculation, in which the characteristics of tumors and of leukemia alternate or are mingled. They agree with Magrassi's concept of a tumorous process caused by a virus.

Treatment of Hypothyroidism with Halogenated Proteins.—The authors treated 67 patients with various manifestations of hypothyroidism with halogenated proteins. These proteins were prepared by bromination and iodination of casein. They proved to have all the properties of thyroid extracts; they were more active, weight for weight; and, because they contain organically fixed bromine, which by its sedative action counteracts the neurotonic and heart-accelerating effects of thyroxine, they did not have its disadvantages. They were administered in progressive doses, beginning with 50 mg. a day, increasing gradually until, in certain severe cases, as much as 500 mg. was given daily. The drug was given until clinical symptoms receded, after which the daily dose was progressively diminished to 200, 100, and 50 mg. An increase in the metabolic rate, in diuresis, and in the pulse rate appeared by the end of the first week, accompanied by a decline in the serum cholesterol and the recession of clinical symptoms. Apathy and asthenia were among the first of these to disappear; the mind became keener, and the patients showed greater interest in their surroundings.

Revista Española de Tuberculosis, Madrid

20:411-474 (July) 1951. **Partial Index**

*Primary Cancer of Lung. A. Jarne.—p. 439.

Primary Cancer of the Lung.—Jarne observed 21 patients with primary cancer of the lung. The group included 20 men between the ages of 40 and 55 and a woman 60 years old. In 14 patients, the first symptom was cough, alone or associated with pain and small repeated hemoptysis; in 7 patients, it was pain alone or associated with hemoptysis. Four patients had dyspnea, and seven had lost much weight. The sputum of all patients was negative for tubercle bacilli, whereas that of 13 patients, as well as the pleural exudates from a patient with hemorrhagic pleurisy and pleuropulmonary cancer, contained degenerate cancer cells. A diagnosis of cancer of the lung was made roentgenographically. Cancer involved the whole left lung in three cases, one lobe of the left lung in 11 cases, and one or two lobes of the right lung in 7 cases. The upper lobes were more frequently involved than the lower ones. Biopsy was made by bronchoscopy or thoracotomy. Out of 21 patients in whom this diagnosis was made, 6 did not appear for treatment, and 4 died without any treatment. Cure was obtained in one of eight patients who had roentgen therapy. The patient is still living in good health three years after discontinuation of roentgen treatment. Seven patients in this group died. In the group of three patients who had a pneumonectomy one died from cardiac insufficiency a few days after the operation. Two patients are cured and are in good health three years after pneumonectomy.

Ugeskrift for Laeger, Copenhagen

113:1081-1114 (Aug. 16) 1951

*Extraperiostal Pneumolysis: Collapse Operation of Renewed Present Day Interest. O. Christensen.—p. 1081.
*Roentgenologic Demonstration of Localization of Primary Complexes in Extrapulmonary Tuberculosis. E. F. Eisum.—p. 1085.
Late Meningitis After Fracture of Base of Brain. P. Menck-Thygesen and W. Munck.—p. 1087.

Extraperiostal Pneumonolysis.—Christensen says that by combined treatment with dihydrostreptomycin and paraaminosalicylic acid (PAS) patients with far-advanced tuberculosis may often be improved sufficiently for collapse treatment. An increasing number of patients with large cavities need collapse treatment, but thoracoplasty is contraindicated by the condition of the contralateral lung, and extrapleural pneumothorax entails the danger of perforation of large subpleural cavities. In a number of cases in this category extraperiostal pneumonolysis represents the only possibility for effective collapse therapy.

Localization of Primary Complexes of Extrapulmonary Tuberculosis.—Eisum investigated the frequency with which the portal of entry of the tubercle bacilli in patients with extrapulmonary tuberculosis can be determined by roentgenologic examination for calcifications in the lymph node component of the primary complex. Routine roentgen examination of neck, thorax, and abdomen in 144 patients with clinically certain extrapulmonary tuberculosis showed one or more portals of entry in 83 patients (58%), with calcified lymph nodes in the thorax in 69 cases, in the abdomen in 18, and in the neck in 10. The tubercle bacilli were of human type in 70 and of bovine type in 10 of 80 patients studied.

Zeitschrift für klinische Medizin, Heidelberg

148:331-430 (No. 4) 1951. **Partial Index**

Experimental Investigations on Tolerance for Insulin in Healthy Human Subjects. W. Rössel and L. Wullen.—p. 331.
Nitrogen Balance in Parenchymal Lesions of Liver: Their Modification by Choline and Methionine. G. A. Martini and G. A. von Harnack.—p. 341.
Determination of the Neutral C^{17} Ketosteroids in Adiposity, Lipophilic Dystrophy and Other Metabolic Disturbances. G. Lohmeyer and H. A. Ahlhelm.—p. 352.
*Failure of Sympathetic Regulation with Fatal Results After Sympathectomy in Hypertension. K. H. Pfeffer.—p. 380.
Diagnosis and Therapy of So-Called Libman-Sacks' Disease. H. Franke and H. Wördehoff.—p. 396.
Electrocardiographic Studies on Post Mortem Arrest of Cardiac Function in Human Subjects. H. Gillmann.—p. 415.

Failure of Sympathetic Regulation After Sympathectomy.—Of the 176 patients with hypertension (100 men and 76 women) operated on at the Mannheim City Hospitals during the years between 1944 and 1950 according to the procedure of Peet and Smithwick, a total of 54 patients died, 27 of these in direct connection with the operation. The surgical mortality was particularly high during the first two years of this period, probably largely because patients were operated on who later were shown not to have been suitable for sympathectomy. Of these 27 patients, 17 showed signs of infection and various forms of collapse-like failure of the circulatory system. In the second group of 10 cases, death apparently resulted from uremic coma. The preoperative examination of these hypertensive patients revealed in the great majority of cases severe vascular changes. The patients who died in uremia showed in addition before the operation great impairment of renal function. Some observations indicated particularly unfavorable circulatory conditions in the cerebral vessels. The cause of the high surgical mortality is thus explained chiefly by the type of patients operated on. Patients with hypertension in whom the functional and organic vascular disturbances are far advanced are apparently highly sensitive to an intervention that disturbs their sympathetic equilibrium.

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BOOK REVIEWS

Clinical Pediatric Urology. By Meredith Campbell, M.S., M.D., F.A.C.S., Professor of Urology, New York University Post-Graduate Medical School, New York. With section on Nephritis and Allied Diseases in Infancy and Childhood. By Elvira Goettsch, A.B., M.D., Associate Professor of Pediatrics, University of Southern California School of Medicine, Los Angeles, and John D. Lyttle, A.B., M.D. Cloth. $18. Pp. 1113, with 543 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

There is no doubt that this is the definitive work on clinical pediatric urology. For a reference work the detail and completeness are virtues; however, textbooks that pass through several editions often suffer from the fact that, in the interest of completeness, additions are constantly made and deletions are few. The result may be a large and rather unwieldly volume. The author has faced difficulties in deciding the scope of the volume. Should he assume that the reader is well versed in general urology and discuss only the variations concerning infants and children, or should he write a more or less complete treatise on urology, with special attention directed to pediatric problems? The latter course has been chosen and is well exemplified, for instance, in the chapter on urinary calculi in which the entire field, including etiology, pathogenesis, and prophylaxis, has been dealt with at length. Among other subjects, which of necessity overlap and duplicate subject matter found in textbooks of general urology, might be mentioned infection, anomalies, injuries, neuromuscular uropathy, and tumors.

The book is extremely well written, and the author's knowledge of world literature is nothing short of phenomenal. In addition to providing a most complete bibliography at the end of each chapter, the text has been written to portray the developments of each subject from the beginning to the present. In order to do this the author has inserted, in parentheses in the running text, the author's name and year of publication of important articles associated with each step or advance that has been made. Such a method of presentation affords an excellent means of review to the practicing urologist and a most interesting and comprehensive presentation of the subject to the student. The urologist who finds himself confronted with a gradually increasing amount of pediatric urology will especially appreciate the chapter on methods of examination and diagnosis. In this chapter Campbell explains the great difference between methods of diagnosis and treatment in infants and in adults. Detailed description of special urologic instruments available, and their use, will be read with great interest by every urologist. Of no less interest in this regard is the section on nursing care in pediatric urologic surgery, contributed by Helen T. Goddard.

The chapters on embryology and anomalies and urinary obstruction are classics. These are the chapters which everyone thinks of when Campbell's Clinical Pediatric Urology is mentioned. They have been enlarged and improved over the previous edition. The author's wealth of experience in both clinical and necropsy material lends authority to his statements. The bibliographic references inserted in the text make it possible for the reader to survey a vast amount of material quickly. The chapter on operative procedure is well written and illustrated, but here again (except for transurethral procedures, such as litholapaxy and transurethral resection of the vesical neck) it greatly duplicates material found in books on general urology or urologic surgery. The chapter on nephritis and allied diseases in infancy and childhood, written by Elvira Goettsch, is nothing short of a masterpiece. She has clarified a most confusing subject and reduced it to common terms and logic that can be understood by all. The profession will welcome and greatly benefit from this book. The author is to be congratulated on this great contribution, which has required an untold amount of time and work. Probably no better compliment could be paid to the author than to say that, with only a few additions, this work could be redesigned as a two volume book comprising both general and pediatric urology and could take its place as one of the most outstanding books on urology yet written.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

Proceedings of the First Conference on Electrokymography Held May 25-26, 1950, in Bethesda, Md., Sponsored by the National Heart Institute. Editors: Bert R. Boone, Frederick G. Gillick, Russell H. Morgan and Morton J. Oppenheimer. Federal Security Agency, Public Health Service, National Heart Institute of National Institutes of Health, Public Health Service publication no. 59. Paper. 75 cents. Pp. 215, with illustrations. Superintendent of Documents, Govern. Print. Off., Washington 25, D. C., 1951.

About 40 investigators in this special field of investigation took part in this conference. Although the group included nearly all those who are doing research on electrokymography, it was small enough to permit free and detailed discussion of each paper. The various technical aspects of this procedure, as well as the clinical application, were covered well in the papers and discussion that followed.

Electrokymography was developed jointly by members of the staff of Temple University Medical School and the United States Public Health Service. The first electrokymograph made its appearance in 1945. The instrument today is essentially a photoelectric device by which the movements of the heart, as they appear on a fluoroscopic screen, are recorded. The heart border movements and changes in density of the cardiac shadow are translated by the electrokymograph to current changes, which, by means of a beam-type galvanometer, can be made to record on moving bromide paper. The record so obtained is called the electrokymogram. Although the earliest workers were concerned with heart border changes, more recent studies seem to indicate that variations in shadow densities over various portions of the heart may eventually be more important clinically. Although the instrument was first used less than six years ago, it is already evident from the papers and discussion at this conference that enough groundwork has been done to proceed with clinical studies, which may have considerable importance in the future.

This booklet is a good reference book for those who are interested in keeping up with a progress being made in this special field of research. The articles are well illustrated. A bibliography of the important work in electrokymography is given at the end of this book.

Statistics for Medical Students and Investigators in the Clinical and Biological Sciences. By Frederick J. Moore, M.D., Associate Professor of Experimental Medicine, University of Southern California School of Medicine, Los Angeles, Frank B. Cramer, B.A., Research Fellow, and Robert G. Knowles, M.S., Research Associate, Department of Experimental Medicine, University of Southern California School of Medicine. Cloth. $3.25. Pp. 113, with 11 illustrations. Blakiston Company (division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1951.

This book, according to the preface, is more concerned with providing a grasp of the fundamental concepts and philosophies than with developing technical facility in the application of statistical methods. There is reason to doubt whether generalizations can ever be taught without an abundance of specific instances, and, in the case of this book, with its paucity of examples, lack of exercises, vague introductions, and omission of "the mathematics of derivation," there is little that a beginner can get his teeth into. The notion of "control" in the special sense of a contratest (*contre-essai, Gegenversuch*) is not made completely clear, and even a student with some knowledge of biometry is likely to find the allusions to probits baffling. In the hands of an uncommonly good teacher, armed with an abundance of illustrative examples, this book may be useful to graduate students in the clinical and biological sciences, but it cannot be recommended as required or introductory reading for medical students, because its small size is achieved only by the omission of much vital substance.

QUERIES AND MINOR NOTES

STERILIZATION OF NEEDLES

To the Editor:—*Please answer a few questions: 1. Assuming that a syringe and needle are infected with serum hepatitis virus, how long would one have to boil them (submerged in water in a covered enamel dish) to render them safe for use? 2. Would this method suffice when the infecting agent is poliomyelitis virus? 3. Does the addition of 2% iodine to 70% ethyl alcohol enhance it as a skin antiseptic? 4. What do you consider to be the best skin antiseptic for use before administration of injections? 5. How much of a time interval should elapse between application of skin antiseptic and administration of the injection?* *M.D., Illinois.*

Answer.—1. Fifteen minutes actual boiling is recommended if instruments are free from organic substances (e. g., pus and blood). 2. Yes. 3. Yes. 4. and 5. The comparative efficacy of three common types of skin antiseptics is reported by Hanks and Wallace (*Proc. Soc. Exper. Biol. & Med.* **71**:200 [June] 1949). They found that when areas of which biopsy was to be made for tissue culture were covered with a heavy patch of fabric saturated with 3.5% iodine solution (tincture of iodine 1:2 in 70% alcohol by weight) for two minutes and were then recleaned with alcohol bacterial contamination in subsequent cell cultures was eliminated. Recleaning of the area with alcohol removed the residual iodine, which was toxic to cells in vitro. Frequent contamination was encountered when a quarternary ammonium compound and an organic mercurial were employed.

METRIC VERSUS APOTHECARY SYSTEM

To the Editor:—*It has been ruled in this hospital that all orders are to be written in the apothecary system. What is your opinion of this?* *M.D., Oklahoma.*

Answer.—The metric system for recording weights and measures, based on the decimal system, is the preferred system. It is safer and easier to use. "Since 1893 the U. S. Bureau of Standards has defined all weights and measures in terms of metric units. The metric system is the official system of the United States Pharmacopeia and the National Formulary, and many non-official formularies use it. It is much used in prescriptions, and the physicians of the Army and Navy are required to use the metric system exclusively. In 1943 the Council on Pharmacy and Chemistry of the American Medical Association adopted a resolution to use only the metric system to express dosages in its publications. The use of the metric system is legalized in all of the countries of Europe and South America, and in many of them its use is compulsory for all purposes. It is universally used in science." (American Pharmacy, Philadelphia, J. B. Lippincott Company, 1945, p. 9).

PIGMENTED NEVI

To the Editor:—*What is the latest treatment of pigmented plantar nevi? My patient is a 3-year-old girl, and there is no evident disturbance of the lesion.* *M.D., New York.*

Answer.—Although there is still considerable difference of opinion about the treatment of pigmented nevi, it is generally held that all such lesions, particularly if they are black or slate gray, should be excised if they are located on areas, such as a plantar surface, that are subject to repeated irritations. There is some reason to believe, also, that it is best to do so before the onset of puberty. If the histologic examination shows any activity whatever at the epidermodermal junction, the excised area should be extended widely.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

RH CLASSIFICATION

To the Editor:—*Recently I received a report on a blood specimen as follows: Rh factor: positive (Rh$_o$—negative, Rh'—negative, Rh"—positive). Is it not a mistake to call this patient Rh positive, as the report seems to indicate? For could not the patient become sensitized to Rh$_o$-positive blood if it were given to her?* *D. M. Barringer, M.D., Lincoln, Ill.*

Answer.—The blood of the patient in question possesses factor rh", but lacks factors Rh$_o$ and rh', so that this patient belongs to type rh". Since the patient lacks the Rh$_o$ factor, she might become sensitized to this factor if Rh$_o$-positive blood were given to her. Moreover, Rh$_o$ is the most antigenic of the three Rh factors, and the usual cause of Rh sensitization. Therefore, persons like this patient, who lack the Rh$_o$ factor, should be considered Rh negative for clinical purposes. When used as donors, on the other hand, such persons should be considered Rh positive, in order to avoid reactions caused by sensitization to the rh" factor.

FEVER DURING BASAL METABOLISM TESTS

To the Editor:—*In the service manual for the McKesson waterless metabulator, no. 185, appear the following statements: "Each degree of fever will raise the basal rate 7.2%. Patients often have subnormal temperatures. This would, of course, subtract 7.2% per degree." If I interpret this correctly, a patient with a temperature of 97.6 F should have 7.2% added to the reading arrived at. Many technicians do not correct for a subnormal temperature. Would you please advise me as to the accepted procedure on this matter?*

M.D., Nebraska.

Answer.—The manufacturer's statement and your interpretation are correct. However, in routine clinical practice very little attention is paid to the temperature in doing basal metabolism tests, unless the patient actually has fever. When fever is present, the test is usually postponed until the temperature becomes normal.

ANGIONEUROTIC EDEMA OF GALLBLADDER

To the Editor:—*A patient who has had severe hives for over five years occasionally has attacks resembling gallbladder colic. This is followed by an exacerbation of the hives. The gallbladder shadow does not appear in roentgenograms following ingestion of dye. She has been told that this represents internal hives. Could this be possible?* *M.D., Wisconsin.*

Answer.—It is possible to have edema in the gallbladder ducts or in the gallbladder as a result of localized or generalized urticaria or angioneurotic edema. This would be a hazardous diagnosis to make. One of the requirements for localized angioneurotic edema of the gallbladder would be the visualization of the organ by x-ray with dye in the interim between attacks. A more likely cause of the generalized urticaria in this case is the presence of gallbladder infection or other lesion.

SOY BEAN EXTRACTS

To the Editor:—*A man aged 65 informs me that he has experienced definite rejuvenation of his sex life as a result of taking soya lecithin grade "RG" (Glidden). He wants to know if any deleterious effect might follow the long-continued ingestion of this substance. Is there any evidence to show that soya lecithin has any effect on the physiological impotence of old age?* *M.D., Connecticut.*

Answer.—There is no evidence that any of the steroids contained in soy bean extracts have any hormonal action, and there is no evidence that the phospholipids have such an action. No information is available on any deleterious effects from long-continued ingestion.

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JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, SEPTEMBER-DECEMBER 1951

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to individual subscribers in Continental United States and Canada and to members of the American Medical Association and its student organization. No charge is made to members, but the fee for other borrowers is 15 cents in stamps for each periodical. Three journals may be borrowed at a time for a period not exceeding five days. Requests should be addressed to the Library of the American Medical Association. Thus most of these journals are accessible to the general practitioner.

*A. M. A. American Journal of Diseases of Children. Chicago.
*A. M. A. Archives of Dermatology and Syphilology. Chicago.
*A. M. A. Archives of Industrial Hygiene and Occupational Medicine. Chicago.
*A. M. A. Archives of Internal Medicine. Chicago.
*A. M. A. Archives of Neurology and Psychiatry. Chicago.
*A. M. A. Archives of Ophthalmology. Chicago.
*A. M. A. Archives of Otolaryngology. Chicago.
*A. M. A. Archives of Pathology. Chicago.
*A. M. A. Archives of Surgery. Chicago.
Acta chirurgica scandinavica. Stockholm.
Acta gastro-enterologica belgica. Brussels.
Acta medica orientalia. Jerusalem.
Acta medica Scandinavica. Stockholm.
Acta obstetricia et gynecologica scandinavica. Stockholm.
Acta oto-laryngologica. Stockholm.
Acta paediatrica. Stockholm.
Acta physiologica scandinavica. Stockholm.
Actas dermo-sifiliográficas. Madrid.
American Heart Journal. St. Louis.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Medicine. New York.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Occupational Therapy. Milwaukee.
American Journal of Ophthalmology. Chicago.
American Journal of Orthopsychiatry. New York.
American Journal of Pathology. Ann Arbor, Mich.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Practitioner and Digest of Treatment. Philadelphia.
American Review of Tuberculosis. New York.
American Surgeon. Atlanta, Ga.
Anesthesiology. New York.
Angiology. Baltimore.
Annales chirurgiae et gynaecologiae Fenniae. Helsinki.
Annals of Allergy. Minneapolis.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Annals of Western Medicine and Surgery. Los Angeles.
Archiv für Gynäkologie. Munich.
Archiv für klinische Chirurgie. Heidelberg.
Archives of Disease in Childhood. London.
Archives françaises de pédiatrie. Paris.
Archives of Pediatrics. New York.
Archivo di tisiologia. Naples.
Archivos de la Sociedad de Cirujanos de Chile. Santiago.
Archivos uruguayos de medicina, cirugía y especialidades. Montevideo.
Archivum chirurgicum neerlandicum. Arnhem.
Arizona Medicine. Phoenix.
Arquivos de clínica. Rio de Janeiro.
Australian and New Zealand Journal of Surgery. Sydney.
Beiträge zur Klinik der Tuberkulose. Berlin-Heidelberg.
Biochemical Journal. London.
Blood. New York.
Brain. London.
British Heart Journal. London.
British Journal of Cancer. London.
British Journal of Dermatology. London.
British Journal of Experimental Pathology. London.
British Journal of Industrial Medicine. London.
British Journal of Ophthalmology. London.
British Journal of Physical Medicine. London.
British Journal of Plastic Surgery. Edinburgh.
British Journal of Radiology. London.
British Journal of Social Medicine. London.
British Journal of Surgery. Bristol.
British Journal of Urology. London.
British Medical Journal. London.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the Los Angeles Neurological Society. Los Angeles.
Bulletin of the New York Academy of Medicine. New York.
Bulletin of School of Medicine of University of Maryland. Baltimore.
California Medicine. San Francisco.
Canadian Journal of Medical Sciences. Ottawa.
Canadian Journal of Public Health. Toronto.
Canadian Medical Association Journal. Montreal.
Cancer. New York.
Cancer Research. Chicago.
Chirurg. Berlin-Heidelberg.
Cincinnati Journal of Medicine. Cincinnati.
Circulation. New York.
Clinical Science. London.
Connecticut State Medical Journal. Hartford.
Delaware State Medical Journal. Wilmington.
Deutsche medizinische Wochenschrift. Stuttgart.
Deutsche Zeitschrift für Nervenheilkunde. Heidelberg.
Día médico. Buenos Aires.
Diseases of Chest. Chicago.
Documenta neerlandica et indonesica de morbis tropicis. Amsterdam.
Edinburgh Medical Journal. Edinburgh.
Electroencephalography and Clinical Neurophysiology. Boston.
Endocrinology. Springfield, Ill.
Endokrinologie. Leipzig.
Folia haematologica. Leipzig.
Gastroenterologia. Basel.
Gastroenterology. Baltimore.
Geriatrics. Minneapolis.
Giornale di clinica medica. Parma.
Glasgow Medical Journal. Glasgow.
GP (Journal of American Academy of General Practice). Kansas City, Mo.
Haematologica. Pavia.
Hawaii Medical Journal. Honolulu.
Helvetica paediatrica acta. Basel.
Hoja tisiológica. Montevideo.
Hospital. Rio de Janeiro.
Illinois Medical Journal. Chicago.
Industrial Medicine and Surgery. Chicago.
International Journal of Leprosy. New Orleans.
Irish Journal of Medical Science. Dublin.
Journal of Allergy. St. Louis.
Journal of American Medical Women's Association. Nashville, Tenn.
Journal of Applied Physiology. Washington, D. C.
Journal of Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bacteriology. Baltimore.
Journal of Bone and Joint Surgery. Boston.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. Cincinnati.
Journal of Clinical Pathology. London.
Journal of Endocrinology. London.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Gerontology. St. Louis.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Infectious Diseases. Chicago.
Journal of Insurance Medicine. Louisville, Ky.
Journal of International College of Surgeons. Chicago.
Journal of Investigative Dermatology. Baltimore.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal of Laryngology and Otology. London.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal de médicine de Lyon. Lyon.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.

* Cannot be lent.

Journal of the Missouri State Medical Association. St. Louis.
Journal of Mount Sinai Hospital. New York.
Journal of National Cancer Institute. Washington, D. C.
Journal of National Malaria Society. Columbia, S. C.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology, Neurosurgery and Psychiatry. London.
Journal of Neuropathology and Clinical Neurology. Chicago.
Journal of Neuropathology and Experimental Neurology. Baltimore.
Journal of Neurophysiology. Springfield, Ill.
Journal of Neurosurgery. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
Journal of Pharmacology and Experimental Therapeutics. Baltimore.
Journal of the Philippine Medical Association. Manila.
Journal of Physiology. London.
Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Tropical Medicine and Hygiene. London.
Journal of Urology. Baltimore.
Journal of Venereal Disease Information. Washington, D. C.
Journal-Lancet. Minneapolis.
Kentucky Medical Journal. Bowling Green.
Klinische Wochenschrift. Berlin-Heidelberg.
Krebsarzt. Vienna.
Lancet. London.
Laryngoscope. St. Louis.
Lyon chirurgical. Lyon.
Maandschrift voor kindergeneeskunde. Leyden.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina. Buenos Aires.
Medizinische Monatsschrift. Stuttgart.
Medizinische Welt. Stuttgart.
Mental Hygiene. Albany, N. Y.
Military Surgeon. Washington, D. C.
Minerva chirurgica. Turin.
Minerva ginecologica. Turin.
Minerva medica. Turin.
Minnesota Medicine. St. Paul.
Monatsschrift für Kinderheilkunde. Berlin.
Münchener medizinische Wochenschrift. Munich.
Nebraska State Medical Journal. Lincoln.
Nederlandsch tijdschrift voor geneeskunde. Amsterdam.
Neurology. Minneapolis.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal. New Orleans.
New York State Journal of Medicine. New York.
New Zealand Medical Journal. Wellington.
Nordisk medicin. Stockholm.
North Carolina Medical Journal. Winston-Salem.
Northwest Medicine. Seattle.
Obstetricia y ginecología latino-americanas. Buenos Aires.
Ohio State Medical Journal. Columbus.
Ophthalmologica. Basel.
Paris médical. Paris.
Pediatrics. Springfield, Ill.
Pennsylvania Medical Journal. Harrisburg.
Physiological Review. Baltimore.
Plastic & Reconstructive Surgery. Baltimore.
Postgraduate Medicine. Minneapolis.
Practitioner. London.
Praxis. Bern.
Prensa médica argentina. Buenos Aires.
Presse médicale. Paris.
Proceedings of Royal Society of Medicine. London.
Proceedings of the Society for Experimental Biology and Medicine. Utica, N. Y.
Proceedings of Staff Meeting of Mayo Clinic. Rochester, Minn.
Psychiatric Quarterly. Utica, N. Y.
Psychiatry. Washington, D. C.
Psychoanalytic Quarterly. Albany, N. Y.
Psychoanalytic Review. Albany, N. Y.
Psychosomatic Medicine. New York.
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SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "ab," abstracts; the asterisk (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Acad.—Academy *Indust.—Industrial*
Am.—American *Inst.—Institute*
A.—Association *Internat.—International*
Coll.—College *M.—Medical*
Commn.—Commission *Med.—Medicine*
Comm.—Committee *Nat.—National*
Conf.—Conference *Pharm.—Pharmaceutical*
Cong.—Congress *Phys.—Physicians*
Dist.—District *Soc.—Society*
Div.—Division *Surg.—Surgery*
Found.—Foundation *Surgs.—Surgeons*
Hosp.—Hospital *S.—Surgical*

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